

OCTOBER 1919 No. 185

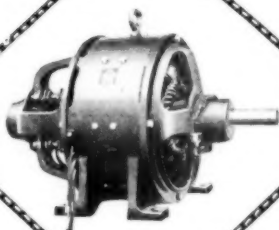
Monthly

A Reference for Buyers

**HITCHCOCK'S
MACHINE
TOOL LIST**

Distributed Free to Machine Tool
Users Everywhere in the United States and to
Dealers in American Machinery Abroad

Published by
A. H. HITCHCOCK
1220-1235 Caxton Building
Chicago



Sizes up to 150 h. p.

If you have gained the impression that we make only small motors, it is wrong. Type T motors are built in sizes up to 150 horsepower, open rating. They are furnished in the open, semi-enclosed, and fully-enclosed types with either shunt or compound windings.

Type T motors are designed for general service purposes for constant or adjustable speed duty. Speed adjustments are obtained by field resistance control.

The complete story of how the practical experience of 35 electrical engineers was built into these motors is told in Bulletin 2014.

Reliance Electric & Engineering Co.
1050 Ivanhoe Road, Cleveland, O.

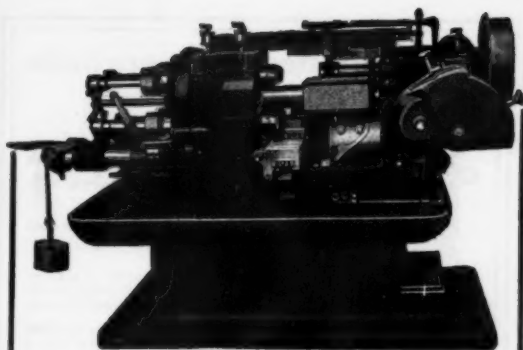
BRANCHES:

Boston New York Philadelphia Pittsburgh Chicago

Type **T** *Heavy Duty*
RELIANCE MOTORS
Direct Current







GRIDLEY MULTIPLE SPINDLE AUTOMATICS

For rapid Production, Accuracy and Labor saving on all classes of Screw Cutting from 9-16" to 2¼" diameter inclusive.

Catalog ?

THE NATIONAL ACME COMPANY

WINDSOR, VERMONT

General Offices, Cleveland, O. Canadian Screw Plant, Montreal, P. Q.

Branch Offices :

NEW YORK

BOSTON

CHICAGO

DETROIT

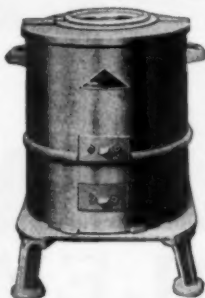
WAREHOUSES—NEW YORK, CHICAGO

With FOREIGN REPRESENTATIVES

Makers of Gridley Single and Multiple-Spindle Automatics at Windsor, Vt., and Acme Automatics, Threading Dies and Screw Machine Products at Cleveland, Ohio

3 Simultaneous Operations

"Triad" Lead and Cyanide Bath Furnace



Heating for

- (1) Hardening in the Lead Bath
- (2) Hardening in the Semi-Muffle Furnace
- (3) Forging in the Combustion Compartment

Carries on three processes at less than cost of one. High temperatures quickly obtained with only one gas or oil burner.

The charcoal iron pot, being suspended instead of resting on a pedestal or brick, is uniformly heated and does not oxidize. Saves time, space, and money.

Write for Catalog No. 5

The W. R. Bennett Co., P. O. Drawer X
Elmwood, Conn.

Grant Rotary Rivet Spinner



Accurate — Economical Vibrationless—Noiseless

This riveter produces results far greater in *quantity*, superior in *finish* and *uniformity*, and is *more dependable* than any other machine on the market. *It can be operated by cheap help.*

Finished heads are perfectly smooth, with no hammer or tool marks. Articles requiring flexibility are riveted with absolute uniformity.

Besides giving better results, this machine is *noiseless*. There is no succession of hammer-like, nerve-racking blows.

You can get actual proof of these claims

Write for Catalog

The Grant Mfg. & Machine Co.
C. E. Station, Bridgeport, Conn.

Brown & Sharpe Milling Cutters.



PROMPT DELIVERIES

Prompt action on your part
in placing your order will in-
sure you of prompt deliv-
eries on

BROWN & SHARPE MILLING CUTTERS

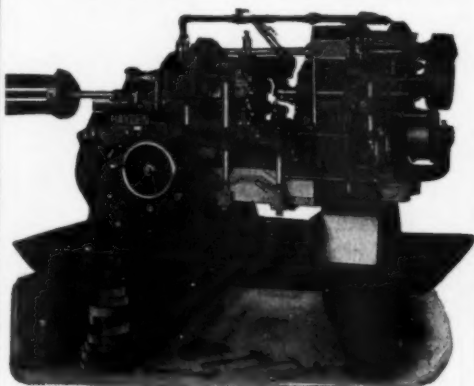
and the perfect satisfaction
that accompanies these
quality made cutters.

Cutter catalog at your request

BROWN & SHARPE MFG. CO.
PROVIDENCE, R. I.

Cincinnati Automatic Five-Spindle Screw Machine

A Tool of Ultimate Economy



The Cincinnati Automatic is a tool of ultimate economy, so far as present-day knowledge will permit.

Its 48 Superior Features, which are fully described in the Catalog, make it easy to set up, easy to tool, and easy to operate.

As to practical results, it turns out work of the greatest accuracy at the rate of one piece, according to its character, *every 2½ to 36 seconds*.

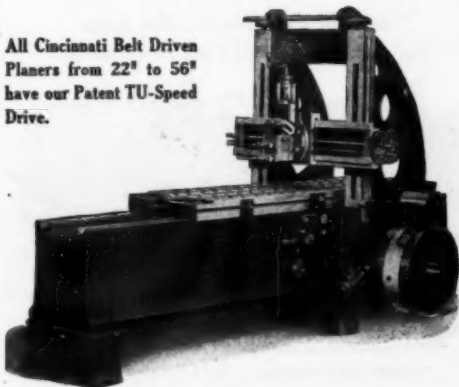
Write for Catalog, and look over the 48 points in which the Cincinnati Automatic excels.

Cincinnati Automatic Machine Co.
Oakley, Cincinnati, Ohio

Cincinnati Tu-Speeds

Are in Line with Modern Saving

All Cincinnati Belt Driven Planers from 22" to 56" have our Patent TU-Speed Drive.



Cincinnati Patent Tu-Speed Planers provide a speed for roughing and a speed for finishing. The change is made from one to the other while the machine is running by simply shifting a lever. This important feature, with their easy manipulation and great rigidity, materially reduces cutting time and increases output.

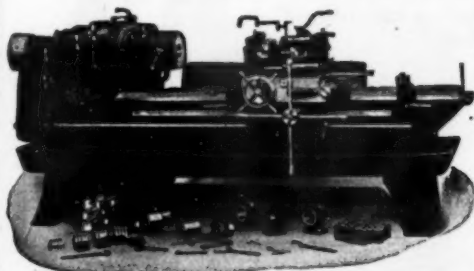
Time saved on planers, and increased planer production, have the same cash value as the saving of time and the increase in output on any other machine in the shop. And modern saving includes everything which can be made to produce more at less cost.

If you believe in modern methods, let us describe and quote on the sizes in which you are interested.

The Cincinnati Planer Co.
Cincinnati, Ohio, U. S. A.

The **Cincinnati-Acme** Flat Turret Lathe

The most rigid Turret Lathe made
For machining detail parts in quantities



3 $\frac{1}{4}$ x36" Bar Capacity. 16" Chucking Capacity.

Its adaptability to a wide range of work, its simplicity and ease of control, its unequalled rigidity and exceptional economy of operation, commend it to the manufacturer who is seeking to lower production costs.

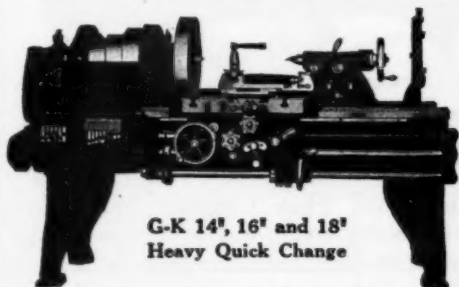
If we can help you solve some of your manufacturing problems, as we have done for others, you will find that it was well worth the time taken to look into it.

And if it is worth doing at all, why not now?

The Acme Machine Tool Co.
Cincinnati, Ohio, U. S. A.

From 14 to 30-Inch G-K Engine Lathes

**Heavy Quick Change Type and
Geared Head Single Lever Control Type**



**G-K 14", 16" and 18"
Heavy Quick Change**

Our illustrated Catalog is called "G-K Betterments," because the description of G-K Engine Lathes is a description of lathe improvement.

One of the "betterments" described is the location of the headstock and tailstock back of the center line of bed. This brings the tool pressure inside the V's, even when turning large diameters. This insures perfect alignment under strain and eliminates the possibility of carriage creeping on the ways, tool chatter, etc. It also describes other "betterments" of a highly practical nature.

*Write for a copy of "G-K Betterments"
for the whole story*

**The Greaves-Klusman Tool Co.
Cincinnati, Ohio, U. S. A.**

The Safe, Efficient, Economical "Duplex" Emery Wheel Dresser

With "Diamond" Cutter for Large, Coarse Wheels or
"Improved" Cutters for Finer Work and General Use



Showing the "Duplex" Dresser Disassembled

It is extremely simple. No wrench required for assembling. An aluminum hood makes the operator safe. The "Duplex" is unexcelled in safety, efficiency, simplicity, durability and economy.

Sure we ship on trial—just say the word

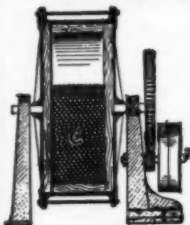
Cleveland Flue Cleaner Mfg. Co.
321 Frankfort Ave., N. W., Cleveland, Ohio

The Abbott Burnishing Barrel

And Carbonized Steel Ball Process

Is Much Cheaper

Burnishing small metal parts by the wholesale, it *reduces costs from 75 to 99 per cent* compared with hand buffing one piece at a time.



It's Also Better

The steel balls do not remove any of the surface of the articles they are polishing—they *burnish and harden* it, producing a brilliant finish.

*Write for booklet and send samples for burnishing
Large Stocks of Burnishing Balls for immediate shipment*

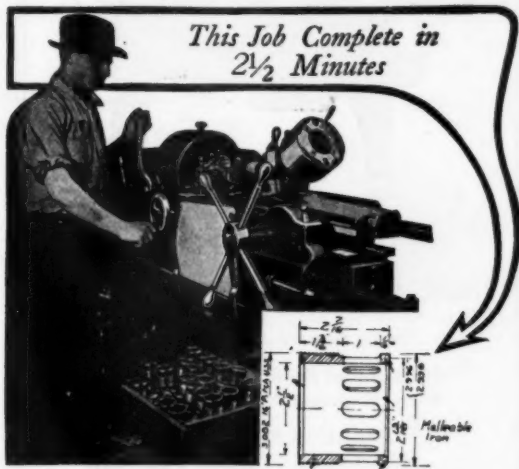
The Abbott Ball Company

Elmwood District, Hartford, Conn.

The most extensively used modern method of ball burnishing in the world.

THE TILTED TURRET

A CLEAR TRACK — THE STOCK



The TILTED TURRET MACHINES

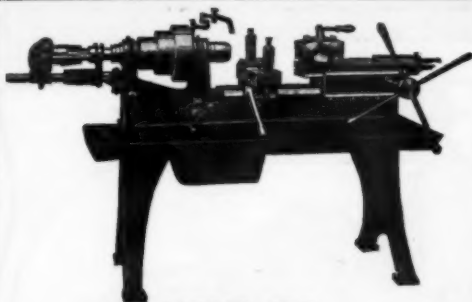
are accurate and productive.
Fifteen years' of thoroughly
tested service. A size for
every class of manufacturing.

Ask the User

Catalog "H"—Its Free

WOOD TURRET MACHINE CO.

BRAZIL INDIANA USA



MODEL "D"

Turret Lathes and Screw Machines

Now Ready for Delivery

**Designed for Rapid Manufacturing of
Parts Requiring Several Operations**

MADE IN FOUR SIZES:

- No. 2 { $1\frac{1}{8}$ " Wire Feed Capacity, Plain Head
 { $1\frac{1}{8}$ " Hole Through Spindle.
- No. 3 { $1\frac{3}{8}$ " Wire Feed Capacity, Plain Head
 { $1\frac{1}{2}$ " Hole Through Spindle.
- No. 4 { $1\frac{1}{2}$ " Wire Feed Capacity, Geared Head
 { $2\frac{1}{8}$ " Hole Through Spindle.
- No. 5 { $1\frac{7}{8}$ " Wire Feed Capacity, Geared Head
 { $2\frac{3}{8}$ " Hole Through Spindle.

**With or Without Power Feed to Turret Slide.
Mechanically Perfect and Fully Guaranteed.**

Manufactured By

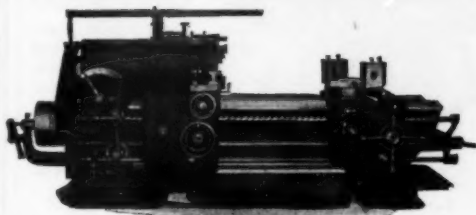
Smurr & Kamen Company

328-330 N. Albany Ave., Chicago, Ill.

STEINLE TURRET MACHINE CO.

MADISON, WISCONSIN

Originators of the Heavy Duty Full Swing Side Carriage Turret Lathe



Steinle 24" Full Swing Side Carriage Turret Lathe

Machine is regularly furnished belt driven or arranged for motor drive.

Actual swing over ways.....	24"
Swing over side carriage.....	21"
Diameter of hole through spindle.....	4" or 6 1/4"
Traverse of side carriage and of turret carriage.....	56"

Both carriages have independent quick change feed and independent power traverse all controlled from carriage aprons.

Side carriage can be run past the chuck and is equipped with cross slide having power cross feed and with turret tool block having four tool holders.

There are thirty reversible spindle speeds available. One belt or one motor furnishes power for all functions of the machine.

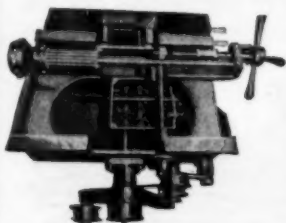
Turret is massive and designed particularly with a view to rigid support of tool equipment.

Send us drawings of gas engine fly wheels, cylinders where cast singly, pistons, and piston rings. Let us give you production estimates and the cost of tool equipment for these and other pieces and also let us tell you the time required to change the tool settings for the different pieces.

Numerous repeat orders received from many of the principal manufacturers of tractors, trucks, aviation motors, marine gas engines, and stationary engines demonstrate the satisfactory results obtained from the use of our machines.

Modern Gear Feed Lathes

Made from J. & L. Friction Feed Turrets



With Our New Gear Feed

Easily installed, or we will install at cost and repair or rebuild your old Jones & Lamson turret lathes.

Many repeat orders tell a story of satisfaction and a larger output.

Let us make them modern producers at light cost

A. V. Wiggins & Co., Dept. H
384 W. Fayette St., Syracuse, N. Y.

Make Your Lathe a TURRET Lathe

With the Newman Tail Stock Turret

A real machine tool that stands all strains the tailstock will. Invaluable in emergencies and efficient on long, hard runs.

Will fit
any lathe

Attach in
15 seconds

Sent on
10 days'
trial

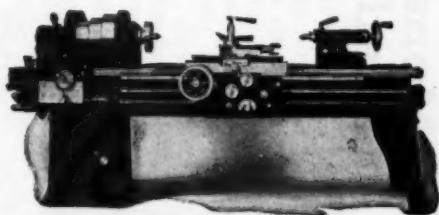


Write us today; state outside diameter of tailstock spindle

NEWMAN MANUFACTURING CO., Cincinnati, O.

Boye & Emmes Instantaneous Change Gear 18" Engine Lathe

Double Back Geared—Double Plate Apron



Any pitch or feed shown in the Index below is instantly obtainable without the removal of a gear.

The Boye & Emmes 18" has a reverse in the head for screw cutting, reverse in the apron for feeds, power cross feeds, etc. The longitudinal and cross feeds cannot be engaged when cutting screws.

This sturdy, powerful, accurate lathe is designed for great flexibility and ease of operation, constructed of the best materials obtainable, and most carefully finished. We invite the closest inspection.

INDEX

Front Index Handle in Hole				1	2	3	4	5	6	7	8
Top Index Handle in Hole,	1	Cuts Threads per in.		2	2½	2½	2½	2½	3	3½	3½
" " " "	2	" " " "		4	4½	5	5½	5½	6	6½	7
" " " "	3	" " " "		8	9	10	11	11½	12	13	14
" " " "	4	" " " "		16	18	20	22	23	24	26	28
" " " "	5	" " " "		32	36	40	44	46	48	52	56

Feeds 4 Times Threads per Inch *W.T. Emmes pat., Aug. 26, 1902, Oct. 28, 1902*

The Boye & Emmes Machine Tool Co.

2245-2251 Spring Grove Ave., Cincinnati, Ohio

Monarch Lathes

give universal satisfaction to the user. They have been doing this for years, and this accounts for the ever increasing demand for **Monarch Lathes.** Built in all styles and with any attachments desired.

Sizes 10 to 30-inch Swing

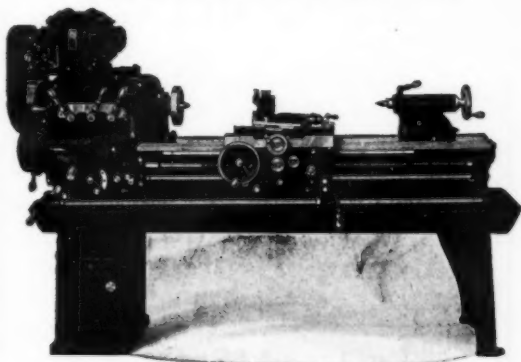
*Sold by a leading Machinery Dealer
in every machinery center.*



The Monarch Machine Tool Co., Sidney, Ohio

Willard MATTMAN BRATTEN Lathe

High Power—All Geared Head—Quick Change
Of Superior Build for the Tool Room



This is a high grade, up-to-the-minute machine which can be relied upon for maximum accurate production every day in the year. We ask you to note a few of its features:—

All gears are chrome nickel steel, and all sliding gears are hardened.

All speed changes are selective inside the headstock, and all gears in headstock run in oil.

There are available six direct speeds. Six further speeds are obtainable thru the back gears, or a total of 12 speeds.

It's impossible to throw in 2 speeds at the same time.

All shafts in the head are equipped with SKF ball bearings.

*It's a superior tool for honest, dependable work
Send for the Catalog and get the whole story*

The Willard Machine Tool Co., Inc.

F Street, Box 784

CINCINNATI, O., U. S. A.

Draw-in and Thrust Chucks

for Tool Room Lathes and Screw Machines. Look for the name "Hardinge Brothers" and write us. And did you ever ask us to make those—

Screw Machine Collets

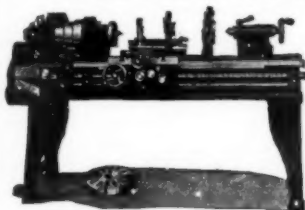
with regular or irregular holes? We are prepared to make good deliveries. Why not try us next time? Quantities never too small or too large to interest us.

When making inquiry, kindly refer to "Chuck Department"

Hardinge Brothers, Inc.
Chicago, Ill.

Rugged and Dependable

The New "Filsmith" High-Power Lathe



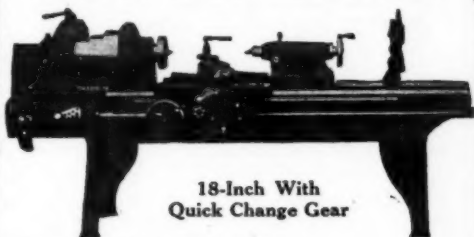
14" and 16" Swing
3-Step Cone
Double Back Gear
Q. C. Gear Box
Any Length Bed

An unusually rugged lathe for its weight. Combines beauty of design, great power for the rated swing, best of materials and workmanship, and many new and exclusive features. On the whole a highly efficient machine which keeps costs down.

PHILIP SMITH MFG. CO., SIDNEY, O.

"Show Me"

Is what we like to hear from lathe users in reference to **"CHARD" SUPER-QUALITY**



18-Inch With
Quick Change Gear

Chard Lathes

Are made in sizes 16", 18", 20", 24" and 28"

We are building into every one of them, of every size, an extra quality which means dependable accuracy and economy. If we may be permitted to tell you how it is done, we shall esteem it a privilege.

On what sizes will you say "Show me"?

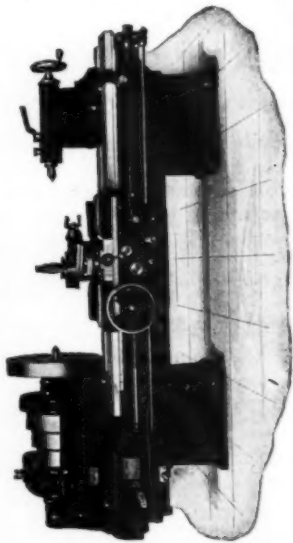
Chard Lathe Company

Newcastle, Ind.

DOMESTIC DISTRIBUTORS

THE F. O. STALLMAN SUPPLY CO., San Francisco, Cal.
VONNEGUT MACHINERY CO., Indianapolis, Ind.
ENGLISH & MILLER MACHINERY CO., Detroit, Mich.
OGDEN R. ADAMS, Rochester, N. Y.
THE W. M. PATTISON SUPPLY CO., Cleveland, Ohio.
J. S. MILLER MACHINERY CO., Pittsburgh, Pa.
MONARCH MACHINERY CO., Philadelphia, Pa.
DALE-BREWSTER CO., Chicago and New York.
THE BIGGS-WATTERSON CO., Dayton, Ohio.

SIDNEY LATHES—For All Requirements



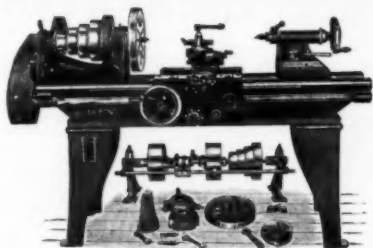
The Sidney Line of medium and heavy duty lathes includes a lathe for every class of work, regardless of the size or type of shop you are running.

Lathes of medium duty in 14, 16, 18 and 20-inch swings, and of heavy duty in 15, 17, 19, 25, 27, 30 and 36-inch swings.

Send for Bulletin No. 45.

THE SIDNEY MACHINE TOOL CO., Sidney, Ohio

South Bend Lathe



Made with straight or gap bed.
Price includes equipment as shown in illustration

For the Machine and Repair Shops

13" Lathe -----	\$ 325	18" Lathe -----	\$ 700
15" Lathe -----	420	21" Lathe -----	900
16" Lathe -----	500	24" Lathe -----	1250

With Beds from 4 ft. to 16 ft. in length.

South Bend Lathes have been on the market 13 years. Over 21,000 in use.

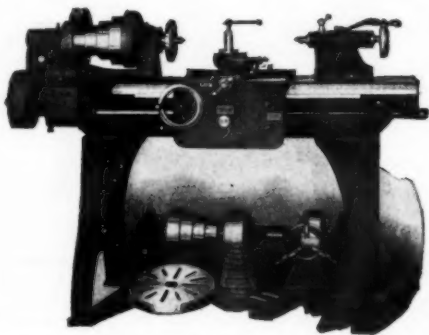
New York Office: - 2½ Murray Street
Boston Office: - - 65 Oliver Street
Philadelphia Office: - 33 N. Seventh St.

Free catalogue mailed on request

South Bend Lathe Works

Established 1906 South Bend, Ind. 430 E. Madison

12" and 14" Worcesters Good Lathes Only



Worchester 12" and 14" Lathes, both Tool Room and Manufacturing, are made with cone drive, with geared head and motor drive, or with geared head and single pulley drive. Each type, as regularly equipped, is a complete lathe in itself—you get it all.

Worchester Lathes deserve their high reputation because of their practical design, careful construction and beautiful finish. They are accurate, exceptionally easy to manipulate, most highly efficient, and cover a wide range of lathe usefulness. When you get a Worchester, you can be sure you are right.

We have handsomely illustrated folders describing the various types of 12" and 14" Worcesters. What are your requirements?

Worchester Lathe Company
68 Prescott St., Worcester, Mass.

"THE SMALL LATHE FOR THE BIG JOB"

"DALTON SIX"

**METAL WORKING
LATHE**
Actual Swing 7 1/2 Inches
MODEL TYPE "B-4"
30 OR 36 INCH LENGTH OF BED



Standard Machine
Mounted with Standard
Type High Legs



Taper Attachment Fits
Any of our Machines



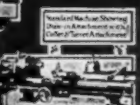
Standard Machine
Mounted with Cabinet
Type High Legs



Standard Bench Type



Standard Bench Machine
Mounted with
Motor Drive



Standard Machine Showing
Draw-in Attachment with
Cabinet Taper Attachment



Standard Machine, High
Legs, with Wheel and
Lever Type Tail Stock



Motor Driven Machine
with Cabinet High Leg
Mounting



MANUFACTURED BY
DALTON MANUFACTURING CORPORATION
NEW YORK, U.S.A. CABLE ADDRESS "ALEDAL" NEW YORK

COMPLETE BULLETINS SENT ON REQUEST

Men Will Do More Work With Better Equipment

A Ritchie-Wertz Modern Bench

will produce results just as surely as any other high class tool, because it helps the man to use his time and effort to the best advantage. It provides a convenient place for his blueprints, tools, stock, etc., a bench of just the right height, and a 5" guard around three sides of the top. Let us refer you to up-to-date manufacturers who are using it. A line will bring complete information.



THE RITCHIE-WERTZ CO., Dayton, Ohio

Blueprints

The Wickes

Continuous Electric.
Sells at half the
price. Uses half
the current
of others.
Perfect prints
up to 48" in
width and of
unlimited
length.

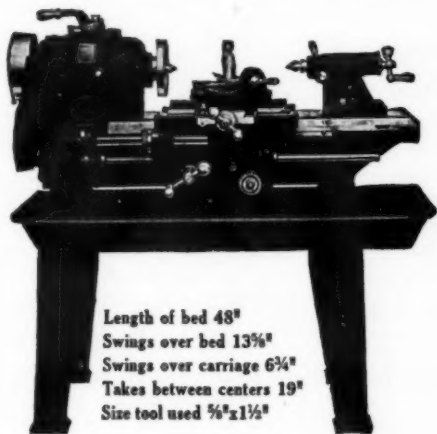


Dept. H

Wickes Bros., Water Street,
Saginaw, Mich.

Adams Short-Cut Lathe

A Specialized Tool for Short Parts



Length of bed 48"
Swings over bed 13½"
Swings over carriage 6¾"
Takes between centers 19"
Size tool used ⅝"x1½"

This is the day of specialization. Don't use big lathes for short parts, when the "Adams Short-Cut" is highly specialized for the rapid production of just that kind of work with the greatest ease, accuracy and economy.

It is simply designed, powerfully built, and is equipped for flexibility, ease of operation and maximum production. It saves time, space and money.

Better look into it, anyhow. Your address?

O. R. Adams Manufacturing Co., Inc.
Rochester, N. Y.

Dickow's 10-in. Universal Index Centers Have Time and Labor Saving Accuracy



**PROMPT
DELIVERY**



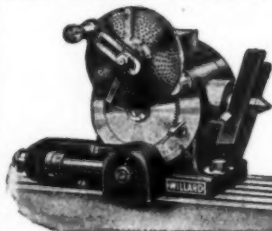
Patents Pending

Production is naturally increased. You will like the improvements—new steel Crank and Sector; new Spindle Lock, etc.

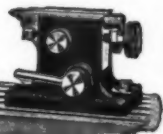
For Dependable Accuracy Get Dickow's
Sold by dealers. Write us for complete description.

Fred. C. Dickow, 1858 W. Lake St., Chicago, Ill.

Handles Heaviest Dividing Jobs



**Ever Encountered
On a Plain
Milling Machine**



Willard 10" Universal Dividing Head

Centers swing 10" in diameter. *Clamping device* is unusually rigid and runs true in every position. *Spindle* has No. 10 B. & S. taper, and is easily adjustable for wear. *Three Index Plates* allow indexing up to 100; a chart shows divisions obtainable up to 380. Made either right or left hand. Complete description on request.

THE WILLARD PRESS & TOOL CO.,

Cincinnati, Ohio

Redface Pulleys

Sheaves and Fly Wheels



PERMANENT: They are permanent, as they are not affected by age, heat, cold or moisture.

RELIABLE: They do not loosen up under vibration or intermittent loading.

RUN TRUE: They run true, steady the line shaft, and have a very small load due to windage.

REDFACE PULLEYS are especially adapted to use on motors, fans, pumps and special machinery.

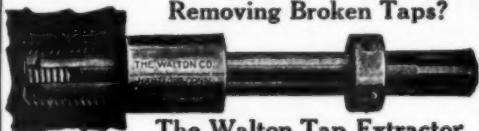
Catalog mailed promptly upon request

Pyott Foundry Co.

Cast Iron Pulleys, Sheaves and Fly Wheels
328 N. Sangamon St., Chicago, Ill.

You Break Taps, Don't You?

How Much Time Do You Spend
Removing Broken Taps?



The Walton Tap Extractor

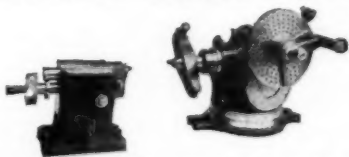
Enables you to remove broken taps in a surprisingly short time and *with no damage to the threads.*

Simply push the four fingers down into the flutes of the tap and screw the tap out by means of a wrench. Made to fit any size from No. 8 to 1¼" tap.

Folder, or trial, or both, upon request.

THE WALTON CO., Hartford, Conn.

"Schipper" 10-Inch Universal Index Centers



Have great solidity for their weight—85 lbs. Head is graduated and can be set at any angle from 10 degrees below the horizontal to 10 degrees beyond the perpendicular. Swings to limit of 10½ inches. Rotates on base to any number of degrees desired.

Workmanship is of highest standard and price is O. K.

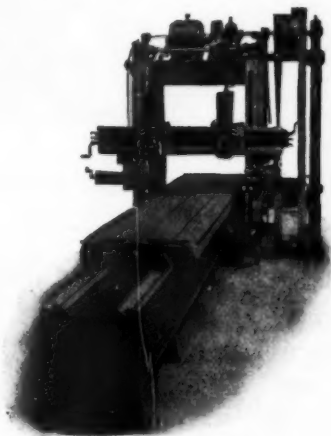
Would you like to know more about them? Write us

Schipper Machine & Tool Co.
Aurora, Indiana

48"x 48"x 16'

Bickett Planer

Belted Motor Drive



Send for Catalogue "B"

Some agency territory still available

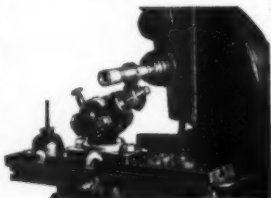
The Bickett Machine & Mfg. Co.
Cincinnati, Ohio

Relieve Your Universal

**Transform your Hand Miller into a
Semi-Universal with our Dividing Head**

It is not good business to load down a high-priced miller with small work which can be handled with this head attached to your hand miller.

Rotated very quickly into any number of divisions from 1 to 24 by even numbers.



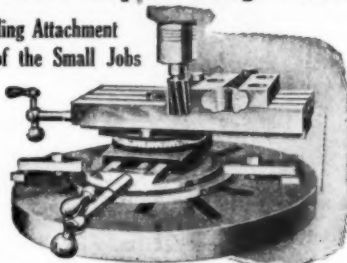
A valuable time-saver. Write for circulars.

Whiting & Comstock, 32 Union Place,
Hartford, Conn.
Export Department, 77 Broad St., New York City

Relieves and Replaces Big Millers

**Davis Milling Attachment
Does 90% of the Small Jobs**

**Converts
any Drill
Press from
14 to 42-in.
swing in
2 Minutes**



Relieves your large millers, comes in handy spotting castings, milling ends of bosses, etc., and does 90% of the lighter jobs as well as a \$1,000 machine; cuts keyseats perfectly. We also have low factory prices on our cylinder reamer for reboring the Ford car, and on our reliable air compressor. Write for details.

Hinckley Machine Works, HINCKLEY,
ILL.

The Lee **A Small Planer** **For Small Planing** **At Smaller Cost**



THE LEE PLANER, favorably known in the past as the Walter Bros. Patent Planer, is now made by a concern which has the financial, engineering and mechanical resources for producing tools of the highest practical merit.

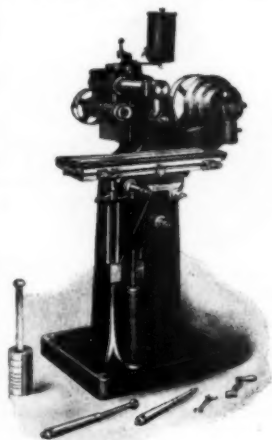
It is a stiff, powerfully-gearred small planer for the saving of time and money in the accurate planing of small work. It is a big planer in all but size and cost, and is more easily and quickly manipulated.

Made in sizes 16x16x42" and 16x16x54".

Get the facts, and you'll want the planer

The Frank H. Lee Co.
MACHINERY DIVISION
Danbury, Conn., U. S. A.

No. 1 U.S. Improved Hand and Weight Feed Milling Machine



Regularly furnished with 3-step cone for $1\frac{3}{4}$ " belt.

Can furnish with 2-step cone and side pulleys, which take $2\frac{1}{2}$ in. belt, for heavy work.

This modern miller has more power than any similar machine of its size. It has quick adaptability and covers a wide range of work.

In the milling of small parts the "U. S. No. 1 Improved" is daily demonstrating its economy of time and cost compared with other machines, large or small.

Its power, rigidity, accuracy, and its conveniences for quick and easy manipulation, enable it to do many milling operations in much less time and at considerably less cost than can be done on larger and more expensive machines.

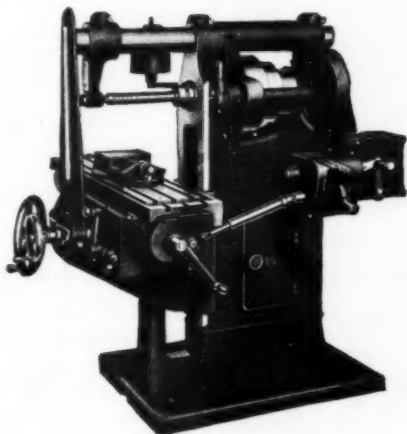
We invite your careful investigation

The United States Machine Tool Co.

Cincinnati, Ohio, U. S. A.

AMERICAN No. 1½ PLAIN **MILLER** BACK GEARED

A Dependable Manufacturing Tool



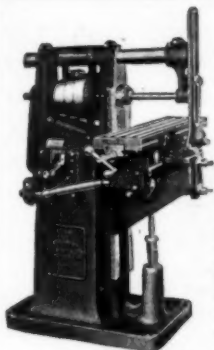
If you want a manufacturing miller that is quick and accurate—that does satisfactory work and lots of it—that keeps costs down to rock-bottom—you can find nothing better than the American No. 1½, illustrated above.

It has plenty of metal properly distributed to withstand all strains, with large bearings, accurate alignment, simple adjustments, and an adequate oiling system.

Furnished with Vertical Spindle Milling Attachment if desired.

You will be interested in the complete description

The American Milling Machine Co.
Cincinnati, Ohio, U. S. A.



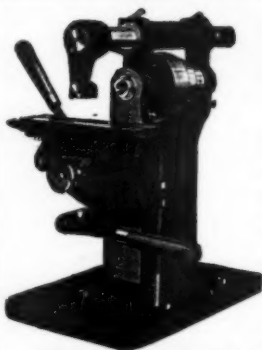
The Davenport No. 2-B Plain Miller

Is a machine of more than ordinary rigidity, accuracy, convenience and power.

The special construction of the arbor support, with a self-aligning ball bearing, makes it unnecessary to harden the arbor, so there is no distortion and no tendency for the cutter to run out of true when the nut is tightened. This insures long life without wear and the accurate milling of gear teeth and other parts which require accurate spacing and thickness.

Write for folder, describing its many special merits

THE DAVENPORT MFG. CO., Meadville, Pa.



Burke's No. 3 Bench Millers

Are Seasoned Tools

Our system of tests insures accuracy, and our methods of construction make it permanent. Frames and parts are carried 6 to 8 months, after work begins on them, before the completed tools receive our final O. K., and all parts are finished and fitted with exceptional care.

Longitudinal feed, 6 in.;
traverse feed, $3\frac{1}{2}$ in.; vertical
motion of knee, 8 $\frac{1}{2}$ in.; table
surface, $3\frac{1}{2}$ x 12 inch.

Write for Catalog, which also shows larger and smaller sizes.

The Burke Machine Tool Co.
Conneaut, Ohio

BECKER

The Machine that Gives the Smooth Finish



Model SD

Superiority of Ranges

is a salient feature that has earned a high place in the Machine Tool Industry for

Becker Belt Driven Millers

The Internal Belt Drive provides an elastic feed to the spindle, eliminating chatter and prolonging the life of the cutter used.

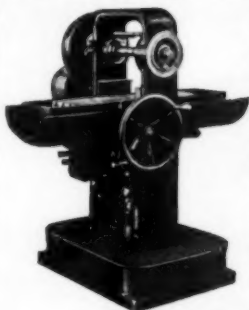
As a production tool The Becker is without an equal.

Circular S701 tells why. Write for it today

Becker Milling Machine Co.

Hyde Park, Boston, Mass.

Better, Quicker Milling



The heavy, rapid cuts that insure lowest manufacturing costs are yours with the modern

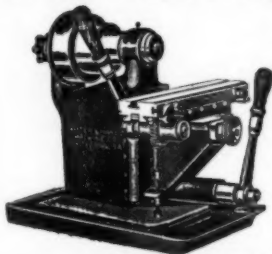
Briggs High Duty Milling Machine

It has no equal for form and gang milling of steel parts, and is as great a favorite in the tool room as it is in the shop. Eight changes of feed.

If economy interests you, write for complete data

GOOLEY & EDLUND, Inc., Cortland, N. Y.

Just The Machine

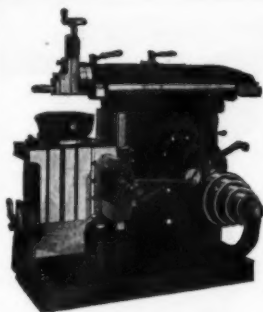


for those light cuts on details for Fire-arms, Sewing Machines, Typewriters, Bicycles, Electrical work, and a thousand and one other details used in the manufacture of the various products of the manufacturing world.

Send for descriptive circular

**The Carter & Hakes Machine Co.
West Winsted, Conn., U. S. A.**

AGENTS—for New England and New York, Hill, Clarke & Co.
WESTERN AGENTS—Marshall & Huschart Machinery Co.,
Chicago, St. Louis, Indianapolis.



Steptoe Shapers *and* Millers

are the product of seventy-four years
of experience in the manufacture of

High Grade Machine Tools

Thousands of our machines in shops
giving daily satisfaction are a recom-
mendation for our product which should
not be overlooked
when buying shapers
and milling machines.

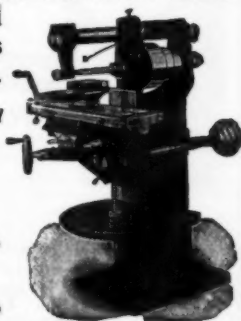
*We will be glad to send
catalogues on request*

—The—

John Steptoe Co.

Stock Yards Station

Cincinnati, Ohio



Weigel Single-Wheel "Kwality Kaster"

Will not crush or break. Swivels on steel machined rollers. The best single caster on the market.

Double-Wheel "Trukaster"

Lasts three times as long as others. Easiest running, strongest, and most durable double-wheel caster made. Has heavy plates and axles.

Write for Circular

**THE HAMILTON
CASTER & MFG. CO.
HAMILTON, OHIO**



Accurate Indexing Assured With the Red-E Milling Dog and Driver



**R
E
D
-
E**

Why?—

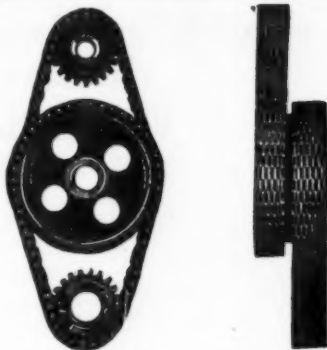
Because the ball sliding in the grooved jaw compensates for the different angles in the driver at different positions of the work.

Lost motion, binding, and cramping—these are absolutely done away with.

Used and highly endorsed by the U. S. Navy

Send for our complete catalog of Steel Bearing Tools

**The Ready Tool Company
Bridgeport, Conn.**



War Record Not Made Public

The "Whitney" Special Quality "Type M" Chains

made a great showing during the war years 1916, '17 & '18

Our tests and demonstrations were made on prominent 8-cylinder motors in service on a large number of cars owned in the State of Connecticut.

During this long period not a single "Whitney" Chain or Sprocket had to be replaced and the condition of every Drive has been pronounced remarkable.

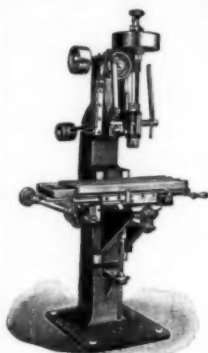
One Drive recently examined had given over 35,000 miles' service and both Chains and sprockets were in such perfect condition that they appeared good for more than double that record (Sprockets having no adjustment).

The links of this SPECIAL CHAIN have finished faces and reamed holes, and the smooth faces do not damage the Sprocket teeth.

Our war contracts were such that we did not announce this SPECIAL CHAIN until after the conflict was over.

The Whitney Manufacturing Co.
Hartford, Conn.

Economical Milling Assured



With a Clough No. 2 Vertical Miller With Slotting Attachment

An economical, rapid, extremely accurate machine, adjustable to 1000's of an inch. Has six-speed, taper-bearing spindle.

Size of table.....28"x9 $\frac{3}{4}$ "
Lengthwise auto feed 21"
Cross motion.....9"
Vertical adjustment.....15"

May we send Catalog?

R. M. CLOUGH
Meriden, Conn.

Pat. Jan. 30, 1917



Just What I Want

Automatic Extension Reel for Electric Lamps.
Light just where wanted.
25 ft. of cord.
Automatically locks and rewinds.
Approved by underwriters.

The Cincinnati Specialty Mfg. Co., Inc.
1913-21 Powers St., - Cincinnati, Ohio
Branch Offices:
205 Abbott Bldg., Philadelphia, Pa.; 39-41 Cortland St., New York

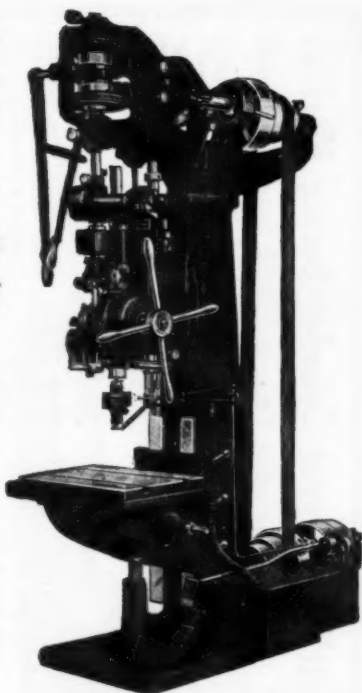
A Surprise

awaits if you do not yet know of the great economy this machine makes possible. What the turret lathe is to the common lathe, the

Turner Turret

is to the ordinary drill press. It enables you to drill, ream, tap and counterbore at one setting, and in that way saves much valuable time.

There is an extremely wide range of speeds—made possible by means of minor gear changes; speeds may be different for each spindle, and all may be easily changed, to accommodate special conditions of stock or tools. It not only increases the output, but improves the quality of the work. Full data is contained in Bulletin FH.



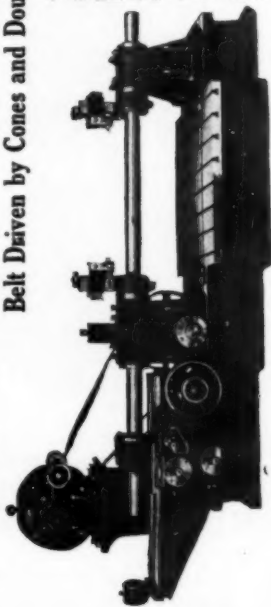
Builders of QUINT TURRET. Ask for Bulletin QH

TURNER TURRET

Turner Machine Company
DANBURY, CONN. and Newark, N. J.
Incorporated with Turner, Atherton & Co., Ltd.,
Denton, Manchester and Stockport, Eng.

No. 2 "Barrett" Horizontal Cylinder Boring Machine

Belt Driven by Cones and Double Speed Countershaft



The "Barrett" is unusually convenient, and has ample power and rigidity for all work within its range. It bores out a cylinder 48 in. long at one setting. A 10 h. p., variable speed, 4 to 1 motor is recommended.

The bed is 13 ft. 1 in. long—widened portion 48 in. wide by 56 in. long, and 18 in. high. The boring bar is 5 in. in diameter. Ten feeds are available.

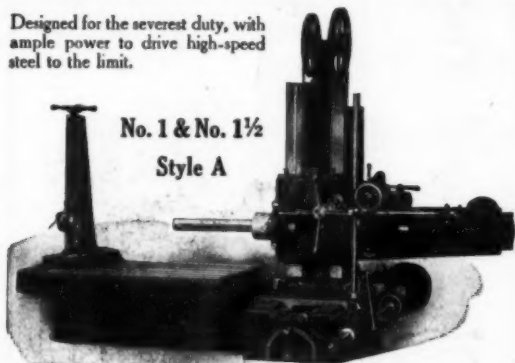
[Glad to forward full data and answer questions—let's hear from you]

BARRETT MACHINE TOOL COMPANY, - - Meadville, Pa.

Builders of all sizes of Single and Double Bar Horizontal Cylinder Boring Machines for boring and facing simultaneously steam, gas, gasoline, pump and locomotive cylinders, also for boring the guides of engine frames and facing off end, besides boring and facing the crank shaft bearings simultaneously.

G. & L. Horizontal Boring Drilling and Milling Machines

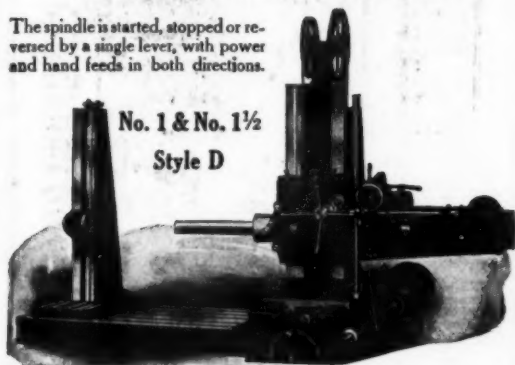
Designed for the severest duty, with
ample power to drive high-speed
steel to the limit.



**No. 1 & No. 1½
Style A**

Either Style with 3½" or 4" Bar

The spindle is started, stopped or re-
versed by a single lever, with power
and hand feeds in both directions.



**No. 1 & No. 1½
Style D**

Write for Full Details and Catalog

Giddings & Lewis Mfg. Co., Fond du Lac, Wis.

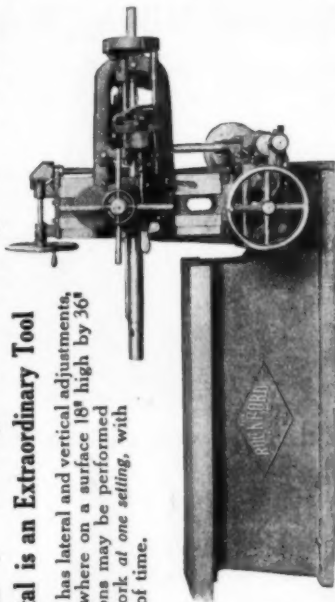
Handles Large, Irregular Shaped Pieces

The Rockford Horizontal is an Extraordinary Tool

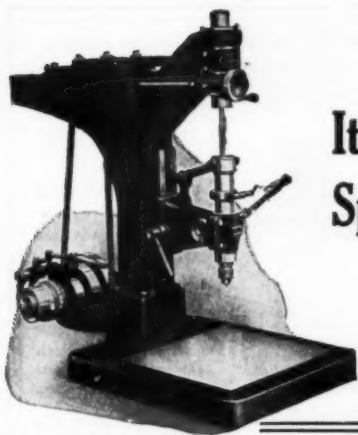
The head of this versatile tool has lateral and vertical adjustments, and the spindle operates anywhere on a surface 18" high by 36" wide. A number of operations may be performed on heavy and odd shaped work *at one setting*, with great accuracy and economy of time.

The Rockford puts increased production within your reach. It drives high speed drills up to 2" and bores up to 6" or over, according to the feed used. Has the accuracy for the finest tool and jig work, and ample power for the difficult tasks. A choice of six driving combinations.

*Write for the
specifications*



THE ROCKFORD DRILLING MACHINE CO., ROCKFORD, ILL.



**It Pays to
Specialize**

**SPEED
12,000
R. P. M.**

**No Vibration
No Heating**

***Ask for full
Information***

**Our
No. 1/2**

Avey

**BALL BEARING
DRILLING Machine**

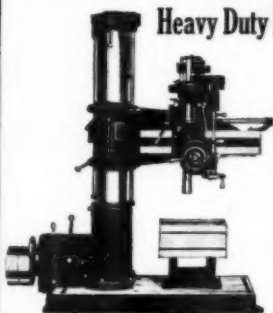
is specially designed for very
light drilling where speed is
the essential rather than power.

**Eliminates Twist Drill
Breakage**

because the drill cuts so fast that
feed pressure does not break it.

The Cincinnati Pulley Machinery Company
Cincinnati, Ohio

It will be worth your while to carefully consider these distinctive features of the



Heavy Duty Mueller Radial Drill

Patented Stationary Column.

Combination Positive and Friction Feed.

Effective, yet extremely simple control.

Combination Low and High speed reverse for backing out taps.

And many others which this space will not permit us to enumerate.

The Mueller Machine Tool Co.

Radial Drills and Lathes

Cincinnati, Ohio



High Grade Ball Bearing Drilling Machines

With 1, 2, 3 and 4 Spindles

Write for descriptive circular

Francis Reed Co.

43 Hammond St.

Worcester, Mass.

**For Speedier Light Drilling
and Tapping**

Hammond High-Speed Sensitive Radial Drills

*Write and find out how you can cut your
light drilling and tapping costs 25% to 33%*



The Hammond Mfg. Co.
Cleveland, Ohio

Excels in Accuracy—

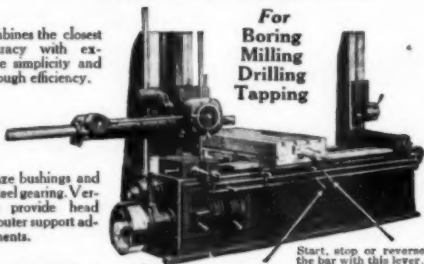
LAMBERT Horizontal Boring Machine

Combines the closest accuracy with extreme simplicity and thorough efficiency.

**For
Boring
Milling
Drilling
Tapping**

Bronze bushings and all-steel gearing. Verniers provide head and outer support adjustments.

An economy tool



Start, stop, or reverse any feed with this lever

Start, stop, or reverse the bar with this lever.

The Lambert Machine & Engineering Company
Cleveland, Ohio, U. S. A.

P. & H. Drilling and Boring Machine

No. 12



1. Rapid traverse in each direction can readily be manipulated by slight adjustments on the hand wheel.

2. The spindle speeds are obtained by quick change gears and variable speed motor for either A. C. or D. C. current resulting in the following speed variations:

A. C. Current, 12 to 542 R. P. M.

D. C. Current, 10 to 445 R. P. M.

3. The four changes of feed available for each speed are made by the operator without leaving his position near front end of spindle.

Pawling & Harnischfeger Company
Milwaukee, Wisconsin



Silver 25" Drilling Machine

First Choice of the Particular Buyer

Silver Drilling Machines have enjoyed great popularity for 65 years. This 25" machine was designed especially to withstand the hardest usage and yet maintain close accuracy. Constructed throughout of the very best materials, it has many modern improvements, which assure great economy and efficiency.

Write for complete description of the 25" or 20" or both

The Silver Mfg. Co., ²⁹⁵ Broadway, **Salem, Ohio**

"Demco" No. 40 Drilling, Milling and Tapping Machine

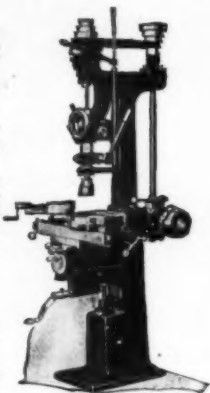
This machine is especially adapted for tool-room work, such as making dies, jigs, etc.

It has both positive and sensitive feed. Has a cone clutch engagement for tapping, drilling capacity of $\frac{3}{8}$ ", and tapping capacity of $\frac{1}{8}$ ". An accurate, handy, durable, and very useful machine.

May we send Circular?

The Demco Machine Tool Co.

Successors to
The DeMooy Machine Co.
706 Frankfort St., N.W. Cleveland, O.



Minster Jr. Drill

The "Minster Junior" is a highly efficient, quiet running, simply constructed machine, ball bearing throughout. It has the power and strength for heavy boring as well as light drilling.

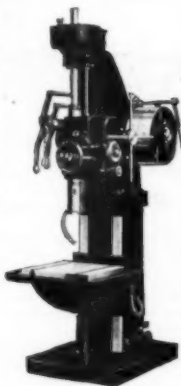
There are six speed and four feed changes, but any desired speeds and feeds may be obtained by changing gears, as shown in folder, which adapts it to an exceptionally wide range of work.

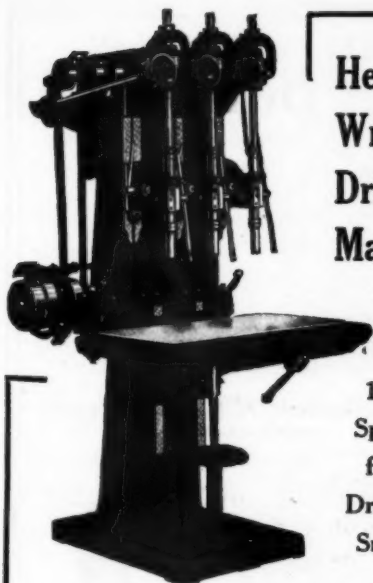
Regularly furnished with tight and loose pulley and with plain table. It may be equipped with driving and reversing clutch and with compound table, also with adjustable motor base, if desired.

Bulletin No. 30 describes it fully

MACHINE TOOL DEPT.

Minster Machine Co.
Minster, Ohio





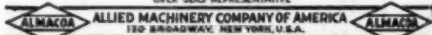
Henry & Wright Drilling Machines

with
1 to 8
Spindles
for $\frac{3}{4}$ "
Drills and
Smaller

The practical elimination of friction in H. & W. Drilling Machines, secured by their gearless power transmission and frictionless bearings, means greater production, less power used, fewer repairs and longer life. Exhaustive tests in many large factories in accordance with the scientific Speed and Feed Chart printed in our Catalog, have led them to standardize their drilling equipment with Henry & Wright's. Write for the Catalog with free Speed and Feed Chart.

The Henry & Wright Mfg. Co.
760 Windsor St., Hartford, Conn.

OVER-SEAS REPRESENTATIVE



Principal Foreign Offices: Paris, Turin, Zurich, Barcelona



"Buhr" Drill Heads

**Adjustable and Fixed Center
All-Ball-Bearing**

Adjustable from 2 to 12
spindles.

Fixed center, any number
of spindles.

We guarantee our Heads
to stand up to capacity.

Nelson-Blanck Mfg. Company
Detroit, Mich.

IT'S JUST AS EASY

To Drill 3 Holes At Once



instead of one, by us-
ing a

Sellew Adjustable

***** Drill Head *****

The economy is so ob-
vious that all who desire
to eliminate waste and
to increase output should
get in touch with us.

We also make Special
Drill Heads with fixed
spindles.

Let's get together



SELLEW MACHINE TOOL CO.,

**Pawtucket,
Rhode Island**

Model "E-50" Sensitive Bench Drill Press

This 2-speed, direct motor drive, high-speed ball bearing drill is especially designed to care for all work, ranging from the smallest to a $\frac{1}{4}$ " hole.

Can be furnished with special pulleys to drive main spindle any speed up to 10,000 R. P. M.

Main spindle is heat treated and ground to size; it is guided through a quill with support at each end in an annular ball bearing.

End thrust is taken up by an end thrust ball bearing under feed arm.

A quick adjustable table has a working surface $5\frac{1}{2}$ " x 5", an . will take work up to $4\frac{1}{8}$ " in height.

Surface of table is ground to insure accuracy.

Table has a self-cleaning taper, which keeps the precisely ground main column free from chips, and serves also as a guard to prevent injury to column.

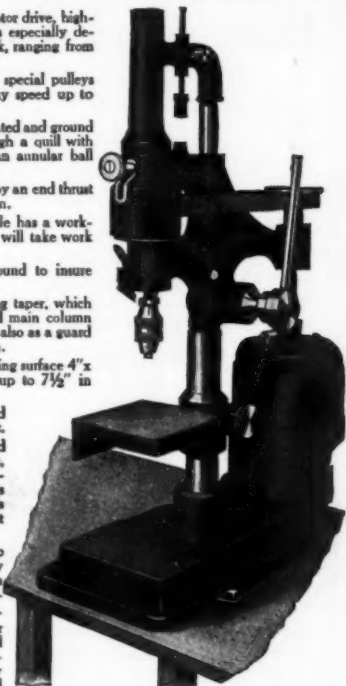
Base has a ground working surface 4" x 6", and will take work up to $7\frac{1}{2}$ " in height.

Base has oil groove and self-cleaning column support.

Your attention is called to another special feature, which is a spindle lock enabling quick changes of drills without the operator's hands coming in contact with belt or pulleys.

An idler pulley takes up any belt stretch which may occur in the endless woven canvas belt, without impairing sensitiveness of machine.

Front pulley and upper part of spindle are guarded by a semi-tubular guard insuring safety. Machine may be operated either by hand or foot control.

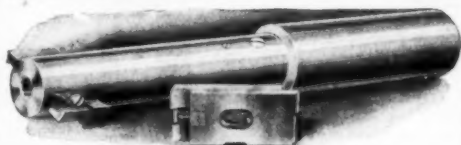


Height over all.....24"
Base..... $7\frac{1}{2}$ " x 18"
Diameter of spindle..... $\frac{7}{16}$ "

Spindle feed..... $2\frac{1}{4}$ "
Weight.....62 lbs.
Will drill to center of a 6" circle.

The High Speed Hammer Co., Inc.
Dept. 14
Rochester, N. Y.

Madison Adjustable Boring Cutters and Bars Minimize Tool Room Work



These cutters replace reamers on automatic machines, turret lathes, boring mills, etc. They can be sharpened and set to within .00025 inch in less than five minutes. Pay for themselves very quickly out of the money thus saved in tool room. Made in 45 sizes—from 1½ to 5" diameter. Larger sizes on application.

A factor in economy. May we send details?

MADISON MANUFACTURING CO., - Muskegon, Mich.
Tool Agents Wanted

The Alert Boring And Facing Tool



High Speed Steel Blades

Made in Three Sizes

FOR USE on turret lathes, automatic screw machines and drill presses, for facing, counterboring and radiusing where a fine finish is desired, and for boring large holes where the cost of high-speed drills is prohibitive. It has bored very accurate holes with a good finish up to six inches deep.

WE ALSO MAKE Ratchet Tap Wrenches, Roller Grip Arbors and Roller Grip Mandrels—all patented; High-Speed Solid Tap Wrenches and Hand Knurling Tool Holders.

Write for descriptive circular "H"

**Alert Tool Co., 237 N. 6th St.
Philadelphia, Pa.**



FEATURES

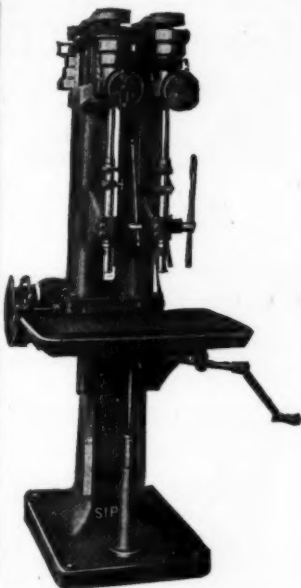
**Quick
Change Speed**
Change in 2 seconds

**Most
Efficient Drive**
No belt troubles

Safety First
All parts protected

**Heaviest
Drill Made**
Yet very sensitive

All Ball Bearings



**What
Users
Say:**

A. T. Hinman, Inc., Philadelphia,
Pa., says:

"We are pleased to advise
that The Sipp is undoubtedly
the best drilling machine we
have in our shop."

Write for Bulletin No. 4 telling why.

THE SIPP MACHINE CO.

Keen Street, Paterson, N. J.

Kelly PRODUCTION Tools



**"XX Type C" Head
For Boring Bars**



Rigid Type Tools

**COUNTER
BORES**



ADJUSTABLE
AND
REPLACEABLE
HIGH SPEED
STEEL BLADES

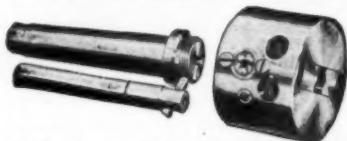
HARDENED
AND GRINDING
REPLACEMENT
JAWS
BORING

Adjustable—Replaceable Blades

Send for our Catalog J-5

THE KELLY REAMER CO., Cleveland, O.

You Want This!



**What? The Flynn Combination
Drill and Micrometer Boring Head**

Saves time, material, and mistakes, by reason of its extreme accuracy. This means economy to the highest degree.

Superior to any other tool for use on milling and horizontal boring machines for jig and fixture or experimental work. Jaws are hardened and ground and are made to take any size drill or bar from 0 to $\frac{3}{4}$ ".

Glad to furnish details on request

**J. M. WATERSTON, 78 Woodward Ave.
DETROIT, MICH.**

The EDLUND

A Better Sensitive Drilling Machine That Gives Superior Service

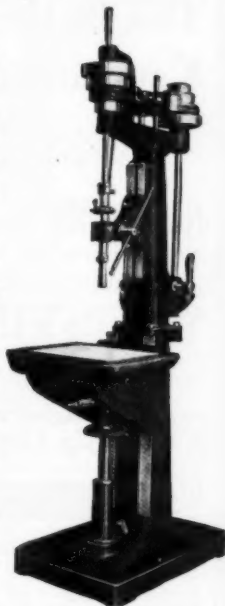
The Economy

of good tools is well known, and that's why we feel you will be thoroughly satisfied with the up-to-date Edlund. It's a quick change machine, speed changes being made instantly by shifting a handle a mere quarter turn. Drive belt can be shifted from either side of machine.

Ball Bearings Thruout

reduce friction and vibration to the vanishing point. Ten ball bearings are used on each spindle. A straight endless belt transmits the power, and thereby the objectionable quarter turn belt is eliminated. There are four spindle speeds of 510, 816, 1273 and 2038 r. p. m. with drive pulley running at 500. Built with one to six spindles.

The large diameter of the cone pulleys, with the large drive pulley, give the machine unusual power. The frame is of heavy construction, with extra large base.



Complete data gladly sent on request

Edlund Machinery Company, Inc.

250-300 Huntington Ave., Cortland, N. Y., U. S. A.

Solve The Problem

By using

The National Keyseating Miller

*For Full Particulars
Write for Catalog O*

National Machine Tool Co.

2266 Spring Grove Ave., Cincinnati, O.



"AUSTIN" Practical Knurling Tool

→ Shank Angled to
Knurl Up Close

ALL FORGED STEEL
PAT. APPL'D FOR



A novice can make a full uniform impression on any metal, with a minimum amount of strain to the machine. Will knurl from 3-16" to 3" diameter.

Write for price and description

Austin Tool & Machine Co., Inc.
915 N. Murtland Ave., Pittsburgh, Pa., U. S. A.

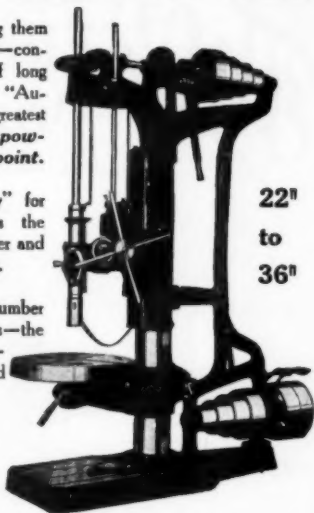
Experts Confirm Our Claims

Users—and among them are many experts—confirm our claim of long standing that the "Aurora" has the greatest pulling capacity, or *power at the drill point*.

The "reason why" for this superiority is the large pulley diameter and the ratio of gearing.

There are also a number of special features—the money saving kind—that you should know about.

For extraordinary drill value consult our Catalog



DRILLING TESTS OF 24" AND 28" DRILL

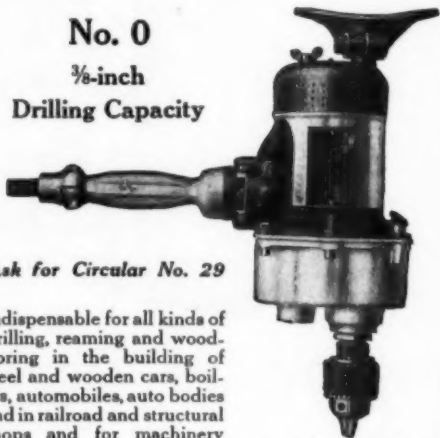
Size of Hole	Spindle Speed	Feed per Minute	MATERIAL
1"	360	9½"	Cast Iron
1"	360	6½"	Mild Steel
1½"	350	6½"	Mild Steel
1½"	350	9"	Cast Iron
1¾"	225	5¼"	Mild Steel
2"	225	6¼"	Cast Iron

The Aurora Tool Works
Aurora, Indiana, U. S. A.

Thor Universal Electric Drills

Licensed Under Burke Universal Motor Patent

No. 0
 $\frac{3}{8}$ -inch
Drilling Capacity



Ask for Circular No. 29

Indispensable for all kinds of drilling, reaming and wood-boring in the building of steel and wooden cars, boilers, automobiles, auto bodies and in railroad and structural shops and for machinery repairs.

Jacobs Chucks furnished as regular equipment.

**Independent Pneumatic
Tool Company**

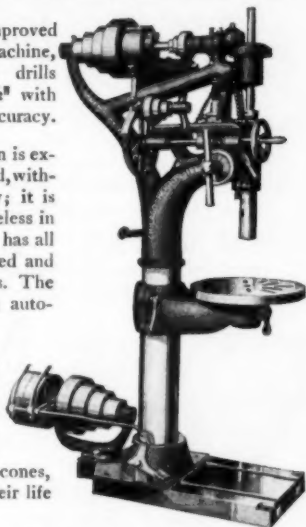
Chicago	New York	Pittsburgh	Cleveland	Detroit
San Francisco	Birmingham	Montreal	Toronto	

The Simple, Fast, Accurate
Canedy-Otto Power Drills
Are Unexcelled as Practical Tools

Our highly improved 20" drilling machine, here illustrated, drills holes up to 1½" with great speed and accuracy.

Its construction is exceptionally rugged, without being clumsy; it is smooth and noiseless in operation, and it has all desirable graduated and automatic features. The gears are cut on automatic machines.

The large bearings are made of the best babbitt metal, with hydraulically pressed sheet graphite cones, which increase their life 300 to 400%.



Furnished for belt drive, or equipped with motor all-spur-gear drive, also with our improved tapping attachment if desired.

You can't do better; write for description and moderate price

Canedy-Otto Mfg. Company
Chicago Heights, Ill.

Manufacturers of Forges, Blowers, Drills, Lathes and Grinders

There's No Better Vise Made Than The "Supreme" Quick Action



Patented May 8, 1919

The "Supreme" has **10 Superior Features** and yet, with all its advantages, it costs no more than other vises.

It is **simple**, having nothing which can get out of order.

It is exceptionally quick-acting, strong, rigid, durable.

It has a **larger range** than other vises of the same size.

Write for literature describing its "10 Superior Features."

SPAFFORD TOOL WORKS, - Hartford, Conn.
Export Department, 77 Broad St., New York City



Nestor Vise

Here are its Features:

Work is gripped almost instantaneously—moves from maximum to minimum with quick action sliding jaw.

For size and weight an extraordinary gripping range is provided.

Hole can be drilled at right angles without taking work from vise.

Special provision makes it impossible for jaws to cock up. Immediate delivery.

Write for particulars, sizes and prices

Nestor Manufacturing Co., Inc.
40 W. 13th St., New York City

**You waste no
time getting
the exact
angle** →

The tilting table,
with accurate
graduations in de-
grees, always
helps to speed up
the work.



To Speed Up Your Machining

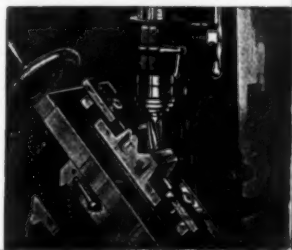
you must have a machine that has greater convenience—quicker adaptation to the work in hand. No matter how difficult the particular job may be, there's always a way with the Knight Milling and Drilling Machine.

It saves time in the shop, tool room and experimental department; on dies, tools, jigs and metal patterns. Built in three sizes—large, medium and small. Send for illustrated folder.

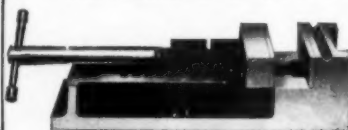
W. B. Knight Machinery Co.

3920 W. Pine Blvd., St. Louis, Mo.

*They mill, bore
and drill at
any angle with
only one set-
ting of the
work.*



Rapid Operating Cincinnati Drill Press Vise For Convenience and Production



Dimensions of No. 5

Width of vise 5 "
Vise opens 6 "
Width of jaws 5 "
Depth of jaws 1 3/4 "
Opening thru
center of base 1 5/8 "

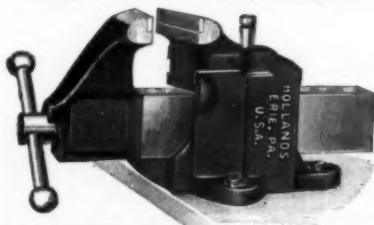
Three seconds is all the time required to shove sliding jaw up to the work and to give a turn to the clamping screw. **Guaranteed to be true in any of the three positions in which it is placed.** Especially adapted to drill press work. Three sizes—3 1/2, 5 & 7".

The vise you need. Let us tell you about it.

Cincinnati Vise Company
Station H., Cincinnati, Ohio, U. S. A.

Hollands Vises

Every Kind for Every Purpose



Our experience of 32 years in making GOOD VISES enables us to meet to the best advantage the practical needs of all kinds of vise users. Write for circulars and prices.

HOLLANDS MFG. CO., Erie, Pa.
Established 1887

Yost Vises

The Favorites of Skilled Mechanics



Solid Jaw, Stationary

Yost Vises are made for every machine shop purpose. The four here shown are only a part of our complete line, as shown in the illustrated Catalog.



Solid Jaw, Swivel Base



Universal Double Swivel

The Yost Drill Press Vise replaces special and costly jig fixtures so often necessary in drill press operations. It has "Yost" quality and convenience.

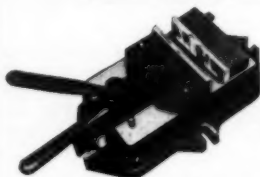


Yost Drill Press Vise

Better have the Catalog on hand for reference

Yost Manufacturing Co.
Meadville, Pa.

Sturdy, Quick-Acting Milling Vise 5-Inch Colt Armory Model



Width of jaw.....5 in.
Depth of jaw.....1 1/4"
Maximum opening.....2 3/8"
Weight.....40 lbs.

Designed for the very hardest, most accurate service. It quickly grasps work with an unshakable grip. Was developed and used throughout the war by one of the largest manufacturers in New England. Its great value was well-

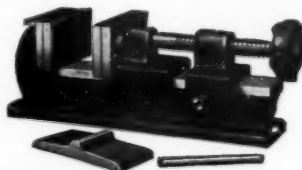
proven when it was subjected to the severities of war-time production.

Base made from special iron. Steel parts drop forged, hardened and ground on all fitting surfaces.

Write for description and moderate price

The Hartford Special Machinery Co.
285 Homestead Ave., Hartford, Conn.

Gem Drill Vise



**Strong and Durable
Quick in Action
Powerful Grip**

Made by

J. E. Martin Tool & Die Co.
548 West State Street, Springfield, Ohio



Take the
Drill Press
to the
Work

Van Dorn



Write Dept. HMTL today
The Van Dorn Electric Tool Co.
Cleveland, Ohio, U. S. A.
Offices in all the principal cities





Burke Quality

Excels on Fine Points

Machines of Burke Quality are never built with any name cast on the frame but our own—

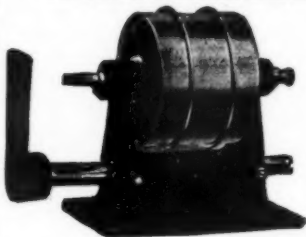
**BURKE
CONNEAUT
U. S. A.**

For Sale Everywhere

Price, \$20.

Burke Tapping Machine

Another Tool of Burke Quality



Pin Clutch Drive
 $\frac{1}{4}$ " capacity, \$20.

Friction Drive
 $\frac{3}{16}$ " capacity, \$20.
 $\frac{7}{16}$ " " 35.
 $\frac{1}{2}$ " " 50.

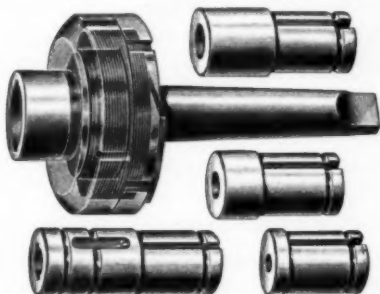
BUILT throughout with exceptional care, our several sizes give service in proportion. Accurate, rapid and convenient, they give solid satisfaction.

Send for details today

The Burke Machine Tool Co., Conneaut, Ohio

Both Safe and Saving—

Time, Labor, Tools and Money Saved
With "Safety" Drill and Tap Holders



Made in Four Sizes—Covering 0 to 2½ in. Diameter

With nothing about them to break or get out of order, the "Safety" drill and tap holders are giving universal satisfaction. Tap breakage is prevented because it is friction driven, which causes spindle to revolve in case of any undue strain. It permits tapping to the bottom.

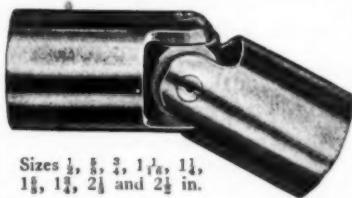
The "Safety" enables your men to maintain maximum accurate production. The change from drill to tap, and vice versa, is made without stopping the spindle—no lost motion. You meet with economy at every turn.

We would like to add you to our constantly growing list of satisfied users. A small trial order will be a good beginning.

The Beaman & Smith Co.
Providence, Rhode Island

The "Giant"

Universal Joints for Heavy Service



Efficient to an
angle of 45
Degrees

Vanderbeek
Universal
Ball Joints
for higher
angle drives

Sizes $\frac{1}{2}$, $\frac{3}{8}$, $\frac{3}{4}$, $1\frac{1}{8}$, $1\frac{1}{2}$,
 $1\frac{3}{4}$, $2\frac{1}{4}$ and $2\frac{1}{2}$ in.

Carefully built, dependable, time-tested, self-oiling and dirt-proof. Wearing ends are hardened steel. Stem ends are strong and well braced. Don't worry over your angular drive problems—put them up to us.

Ainslie Machine & Tool Works

Successors to Vanderbeek Tool Works

HARTFORD, CONN.



Threading

Problems Solved

These tools act with greater safety to the work, last longer than solid ones, save time of backing-out, and eliminate danger of injuring threads.

The best and cleanest threading jobs possible are done with

The Murchey

Collapsing Taps and
Self-Opening Dies

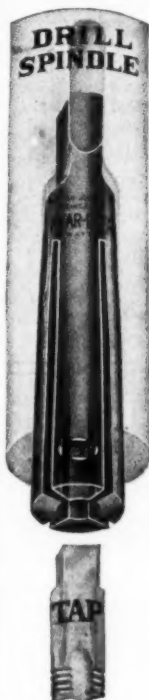
Time of threading is reduced 50 to 75%. Guaranteed to produce accurate, uniform threads at the highest possible speed. Save money wherever used.

If you are interested in a money saver, write to

Murchey Machine & Tool Co., 58 Porter Street
Detroit, Mich.

Reasons For Your Using

"Wear-Ever" Tap Chucks



Here is the answer to your question, "Why should I use Wear-Ever Tap Chucks?"

First—They hold tap and drive it true regardless of variation in size of shank or square. This alone will save about 90 per cent of your tap breakage.

Second—They have no inconvenient and inadequate screw arrangement for truing up taps. They are always ready for work.

Third—They are simple, yet efficient—always a positive drive. No frictions to slip when they should hold, and to hold when they should slip.

Fourth—They are made in one piece of special steel, heat treated, hardened and ground.

Fifth—The price is low.

*A trial order will convince you
Why not NOW?*

Scully-Jones & Company

Suite 555 Railway Exchange Bldg.,

Chicago, Ill.



Woodstock Improved No-Tap-Breakage Chuck Is Trustworthy and Sure

Here is a chuck which positively eliminates tap breakage. It has a friction drive, which is automatically released the instant tap binds or reaches bottom of hole.

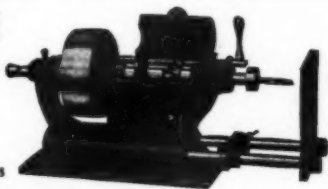
Sometimes in difficult jobs a tap breaks before you can work the stop on the machine. With this Safety Tapping Chuck, however, all such danger is negligible. It saves time and money in any shop.

Ask us to send one on trial

Peter Bros. Mfg. Co.
115 Railroad St., Algonquin, Ill.

Workwell Tapping Machine

**Built for Service
Has Many Fine Points**



2 bar slide to hold work straight with tap.

Steel gears 2" diameter, enclosed and running in oil.

Extra large hardened clutch. One loose pulley with hardened clutch. Non-slip tap holders. Die holder for threading outside threads. Stop adjustment for any depth of thread.

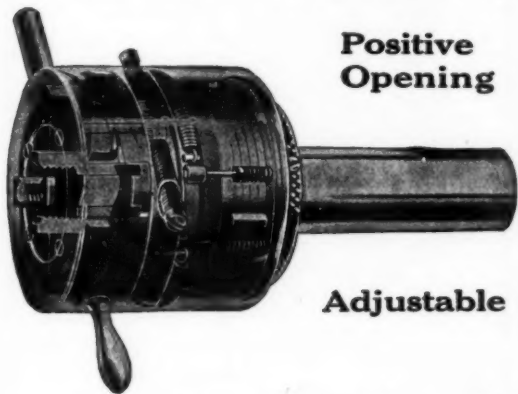
MADE IN TWO SIZES.

Type B 2 for threads to $\frac{1}{4}$ " diameter Type C 2 for threads to $\frac{1}{2}$ " diameter

Give it a trial. Manufactured by

Workwell Engineering & Mfg. Co.
Dept. 2 616-620 W. Monroe St., Chicago, Ill.

A "Boehm" for those hard jobs
is bound to save you money



**Positive
Opening**

Adjustable

And if the "Boehm" can save money doing your difficult work, it will also pay you to use it on the simpler work. The "Boehm" was produced by a corps of experts, and the increased output, reduction in cost and the practical elimination of spoiled work which follows its use, is ample demonstration of its success.

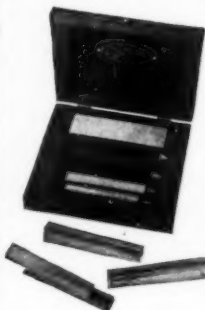
The chasers run in hardened ways. The die is carried on *two* locking pins instead of the usual one, and positive opening mechanism prevents the chasers sticking. The universal taper attachment cam, adjustable for any taper or length of thread, is particularly useful where a variety of threads is required. The "Boehm" Automatic Die Head is made in 21 sizes, from $\frac{3}{8}$ " to 9".

Try one on your hard job—the economy will please you

Rickert-Shafer Co., 1110 Cherry St., Erie, Pa.

A Tool Room Necessity

Herlth Adjustable Parallels



Made of especially prepared steel and *tested for accuracy*. Thoroughly seasoned, they will not change. *Surfaces guaranteed to be parallel.*

May be used independently or in combination with regular size-blocks. Indispensable in gauging slots, setting sine bars, height gauges, etc. Very useful in obtaining odd sizes.

Pay for themselves in a short time, both in saving your regular gauging systems and promoting efficiency in your plant.

O. B. Herlth Manufacturing Co., 90 John St.,
Hartford, Conn.

Increase Your Accuracy With



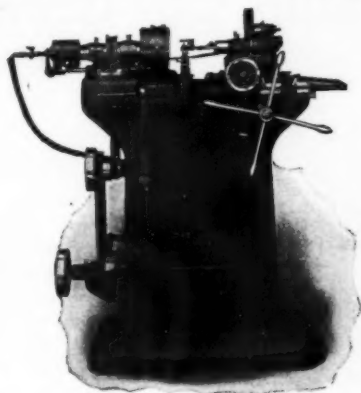
Size Blocks



They are a great help in laying out work on the bench, setting it up in planer, miller, shaper, etc., for adjusting cutters, and for inspection work and checking. Their low cost puts them within reach of every mechanic; shops can afford to carry several sets for constant, free use.

Let us tell you about "Loway" advantages

A. F. WAY CO., Inc., Hartford, Conn.
Export Department, 77 Broad St., New York City
Makers of "LOWAY" Sine Bar and Sine Square



The New Heald No. 85 Internal Grinder

Designed a simple, productive and rigid grinder for small short work. Quick acting collet $\frac{3}{4}$ "x3" capacity. Movement of pilot wheel to right draws out wheel, stops work and shuts off water. Positive stop of table for shoulder grinding.

Three speeds to the work head. Capacity is $\frac{1}{4}$ "x2" dia. x4" long. Swing with guard 6", without guard 10".

Write for bulletins and literature

THE HEALD
MACHINE COMPANY
Worcester Massachusetts

La Salle Plain and Surface Grinder

For General Use in Shop and Tool Room



LA SALLE No. 3

Grinding wheels.....	12"x1"
Between wheels.....	25"
Table working surface.....	7"x24"
Longitudinal movement.....	24"
Traverse movement.....	8"
Vertical travel.....	10"
Height to center of spdl.....	42"
Spindle speed.....	1400 r. p. m.
C. S. speed.....	700 r. p. m.
Floor space.....	63"x46"
Weight, without c. s.....	800 lbs.
Weight countershaft.....	50 lbs.

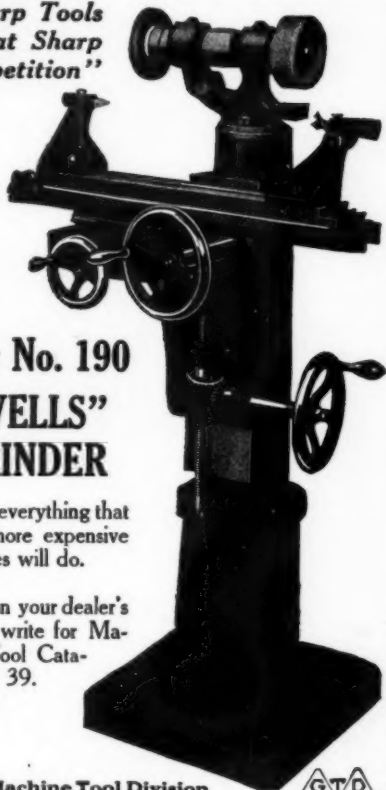
GRINDER SERVICE is what you get out of this large, accurate, rigid machine, for that is what our excellent shop organization has built into it. It is as near mechanically perfect as human skill can make it.

It is made of the best materials, with broad bearings and felt oilers. Vertical screw feed dial is graduated in thousandths. Ways are hand-scraped to master plates. Furnished with both plain and surface grinding wheels, or the latter only, as desired.

Write for full information covering the La Salle Plain and Surface Grinders and American Drill Grinders.

La Salle Tool Company
La Salle, Ill., U. S. A.

***"Sharp Tools
Defeat Sharp
Competition"***



**New No. 190
"WELLS"
GRINDER**

will do everything that
many more expensive
machines will do.

See it on your dealer's
floor or write for Ma-
chine Tool Cata-
log No. 39.

Machine Tool Division



**GREENFIELD TAP & DIE
Greenfield, CORPORATION Mass.**

Accuracy and Precision

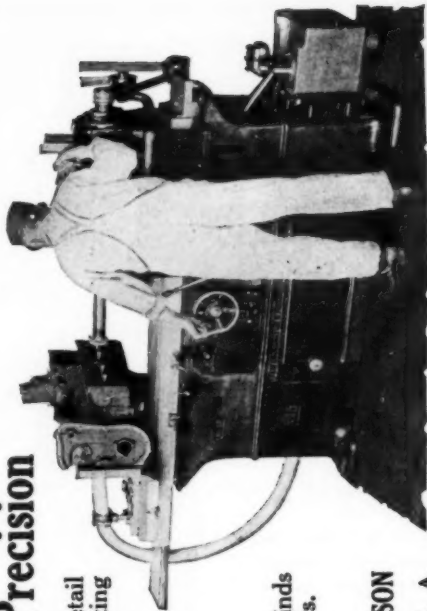
are followed out to the last detail in the construction and testing of the

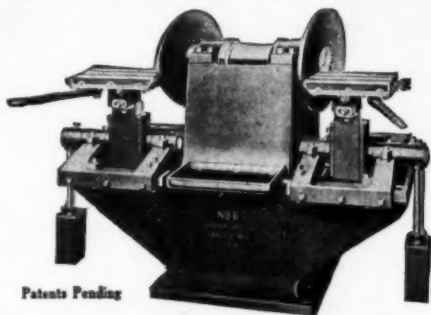
Whitney Cylinder Grinder

equipped for grinding all kinds of Gasoline Engine Cylinders.

Write for new catalog

BAXTER D. WHITNEY & SON
Incorporated
WINCHENDON, MASS., U. S. A.





Patents Pending

Badger Disc Grinder

Embodying the Very Latest Principles
Of Modern Disc Grinder Construction

Our new line of Badger disc grinders represent the first notable advance in disc grinder design and construction that has been made within the past 10 years.

There is no question about the Badger disc grinder being a manufacturing tool—it's built for heavy cuts, not for polishing purposes. Badger construction means accurate results easily and practically obtainable.

The new lever feed work table is so designed that maximum pressure can be secured at very slight energy on the part of the operator. Other patented features of this table make it possible to work to close requirements on a manufacturing basis. The patented wheel truing device is attached to the table and interferes in no way with fixtures or work being ground.

The patented rockershaft construction furnishes a rigid bearing on each side of the table support, thereby eliminating all of the vibration present in the ordinary disc grinder construction. The absence of this vibration improves the quality of workmanship and gives you maximum service from your disc grinder. Badger disc grinders give you bigger production, more satisfied workmen, closer accuracy and decrease your expense for grinding discs and wheels.

Send samples of your work to our Service Department for guaranteed production figures.

We can supply a complete line of disc grinder accessories such as Badger grinding discs, disc wheel cement, abrasive cylinders, etc. Immediate delivery.

Badger Tool Company

E. B. Gardner, Pres. "Disc Grinder Service" R. D. Gardner, Treas.

Beloit, Wisconsin, U. S. A.

Representatives in all principal cities and foreign countries

Speed---Accuracy---Versatility

Developed to a High Degree in the

Greenfield Universal Grinder



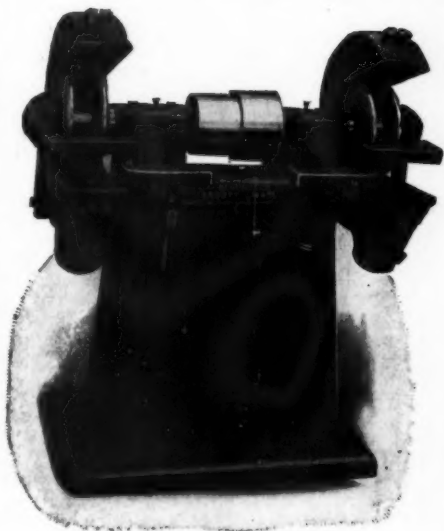
Speed: The Greenfield grinder has a speed that meets all the needs of the modern tool room and reduces cost of production to a minimum.

Accuracy is secured through unusual rigidity. Table has no overhang and is supported the entire length by a heavy, braced cast slide. The whole machine is solidly and carefully constructed.

Versatility: 21 different set-ups on the same machine is proof of its wide range. We believe it is furnished with a larger number and variety of attachments than any other grinder selling at anything like the price. None of our attachments has to be taken apart and made over for some other requirement.

Greenfield Machine Company
Greenfield, Mass., U. S. A.

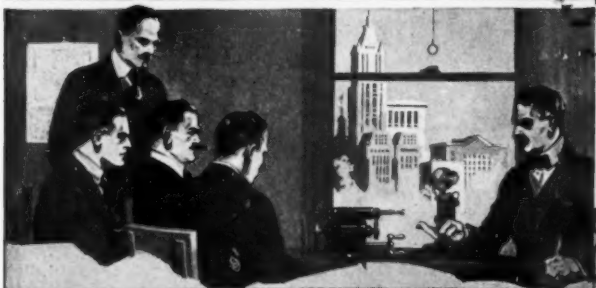
Grind it *on a* **"Blount"**



No. 6½

Our eight sizes meet all requirements of general grinding work. The large bearings insure accurate work under continuous heavy load.

J. G. BLOUNT CO., Everett, Mass.



"I 'VE called you in to see our latest purchase—a DUMORE high-speed grinder. You all know that our tool room has been the weakest spot in the whole organization, as our troubles in die and gauge making show, but this tool is our remedy. Now I am confident we can not only obtain correct standards in our shop but we can also eliminate waste of time and labor. We need the DUMORE in our business."

Make the standards of your tool-room right. The DUMORE insures accuracy because its high speed gives wheels the correct cutting speed and its perfect running balance eliminates vibration. It is portable, weighs but seventeen pounds, and can be used from one end of the shop to the other. Chatter-marks, taper or bell-mouth are unknown in the shop equipped with the DUMORE.

If you haven't a DUMORE grinder already at work, your shop is not as efficient as it might be. Have your supply dealer show you this tool or ask us for literature and prices. Write today, and remember the name—DUMORE.

WISCONSIN ELECTRIC CO.

4315 16th Street

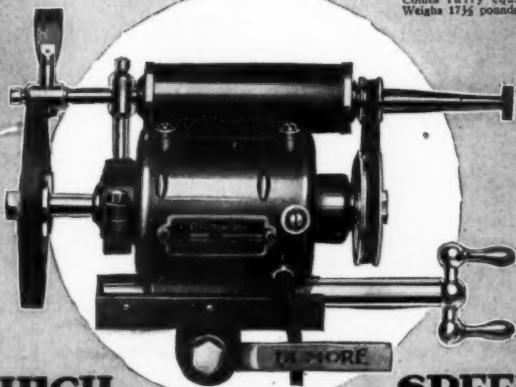
RACINE, WIS.

DUMORE

*Here's What We've
Been Looking For!*

EQUIPMENT A

For general tool room use.
Includes High Speed Internal Spindle A with reach of 3 inches. 30,000 R.P.M. Comes fully equipped. Weighs 17½ pounds.



**HIGH SPEED
GRINDERS**

No More Dull Tools

Where The Thompson Grinder is Used

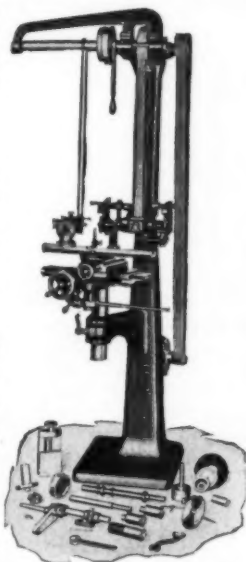
This universal tool and cutter grinder has solved the sharpening problem in many shops. It does the work

So Quickly

and easily, even in the hands of a green operator, that keen cutting tools become the rule—not the exception—and naturally production is boosted.

Its Wide Range

of work is also very gratifying. It does circular, internal and surface grinding on cutters, reamers, counterbores, drill bushings, arbors, small machine parts, etc. Tool grinding is done on one side and cutter sharpening on the other side without interference.



Self-contained—For Motor drive
Also made for Jackshaft drive

*Mechanics everywhere are glad to receive our folder, which contains many illustrated, practical hints.
Write for a copy*

The Thompson Grinder Co.
Springfield, Ohio

Both Accuracy and Capacity

Is Yours in Ample Measure With
The Reid No. 2 Surface Grinder



Rigidity

—is the indispensable cornerstone for dependable precision work on a surface grinder. That is why

The Reid No. 2

has been doing such satisfactory work ever since it was put on the market. Not only is it correctly designed, but the rigidity, the true-running spindle and the closest adjustments assure you of top-notch service every day in the year.

The Spindle

is hardened, ground and lapped, and runs in phosphor bronze bearings, with adjustments for both wear and end play.

The Reid No. 2 grinds work 18"x6"x11½". Table travel automatic in both directions. Cross feed also automatic, but cross feed mechanism may be disengaged to facilitate hand feeding for those who prefer it. Furnished for motor drive if desired.

Reid Bros. Co. 59 Park St.
Beverly, Mass.

Export Department, 77 Broad St., New York City
English Agents, Oliver Machinery Co., Ltd., 201-03 Deansgate, Manchester, Eng.
Also Manufacturers of the Reid Universal Angle Fixture

A Compact, Rigid Grinder

With Many New Special Features



We have incorporated in this machine many improvements and special features in almost every detail. In the construction of—

The "Manhattan" Surface Grinder

—every precaution has been taken which the most modern shop practice has shown to be an aid to efficiency and precision.

It occupies little floor space, yet its great solidity and rigidity entirely do away with vibration.

Fractions of 1000's of an inch may be obtained on both dials. Write for details.

Manhattan Machine & Tool Works

Dept. A.,

Grand Rapids, Mich.

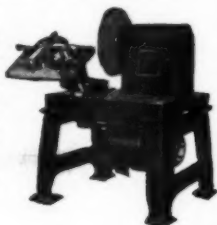
An All Around Economy Tool

Fenn No. 1 Portable Gear Cutter Grinder

The Fenn No. 1 is *portable*—quickly and easily carried to any bench in the shop. The self-contained motor is instantly attached to any 110 v. lamp socket—and your job is done before you would have set up a large stationary cutter grinder. Only 30 seconds is required to change from grinding a 40 pitch to a 3 pitch cutter.

The "Fenn" is also equally adaptable for grinding various formed milling cutters, etc.

Description and price?



Fenn Manufacturing Company

Hartford, Conn.

W. A. FENN

W. L. FENN

Cable Address "Fenn"—Western Union Code

Webster & Perks Universal 10"x30" Cylindrical Grinder



A machine with the tool room accuracy and substantial construction requisite for both quantity and quality production

This completely universal, heavy production, accurate grinder is the culmination of our experience of 25 years in building grinders for various purposes.

Its high degree of accuracy is due to its rugged base and bed; to the rigid construction of sliding table, with the smooth, steady movement imparted by spur gears; the improved operation of the swivel table; the perfect alignment of headstock and headstock base at any position on the table; the ball bearing construction of internal grinding attachment, counter bracket and dead center pulley; the Hyatt Roller Bearings in the counter-shaft, and to its careful design and construction in every particular.

Machines shipped from stock same day orders are received.

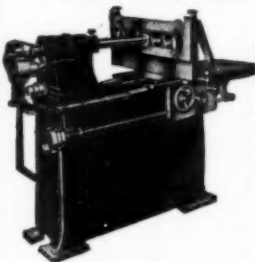
May we send the complete specifications?

The Webster & Perks Tool Co.

Box 1340, Springfield, Ohio, U. S. A.

You'll Appreciate The "Schmidt"

An Accurate, Rapid Internal Grinder



Is invaluable for doing any internal grinding within its capacity. Especially adapted to regrounding tractor, truck and auto engine cylinders.

Compact, occupying small floor space—3'x5'. Its *accuracy* and *rapidity* assure maximum efficiency.

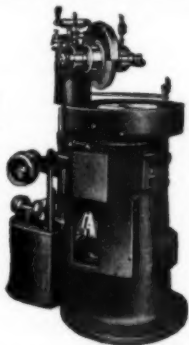
Has ball-bearing rocker arm countershaft and ball-bearing in rear end of emery wheel spindle. Emery wheel arbor made of vanadium steel.

A high-grade economy tool. Immediate deliveries

B. L. Schmidt Co., Dept. A 8, Davenport, Ia.

May we mail
you the descrip-
tion of the

**BRISTOL
12" ROTARY
PRECISION
GRINDER?**



It grinds flat,
convex and con-
cave surfaces to
within .00025"
of manufactur-
ing accuracy.

Bristol Machine Tool Co., Bristol, Conn.

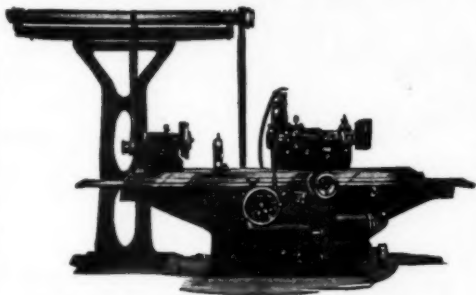
Successors to The C. G. Garrigus Machine Co.

Unequalled for Crankshaft Grinding

The

STERLING

Cylindrical Grinder



Built in sizes

18x50"

18x60"

18x72"

Equipped with

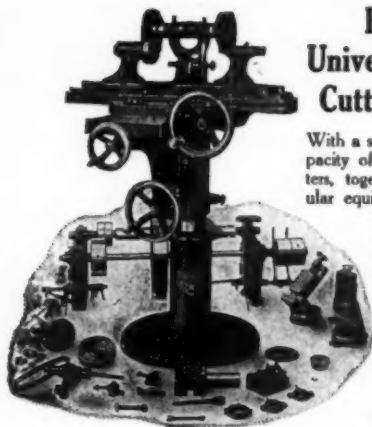
**"Sterling"
Grinding
Wheels.**

Equipped to rough and finish grind wrist pins and crankshaft bearings complete, no lathe work being necessary.

Write for descriptive circular

McDonough Manufacturing Company

Eau Claire, Wisconsin, U. S. A.



Premier Universal Tool and Cutter Grinder

With a swing of 8° and capacity of 15° between centers, together with the regular equipment furnished, it will grind almost any cutter or other tool used in a modern tool room. Workmanship, material and design of the highest quality.

*Write for descriptive
Circular*

Immediate Delivery

Simmons 10" Universal Index Centers



Manufactured with the idea of supplying the market with a device in which accuracy, durability and simplicity are the main issues and in which no one feature is sacrificed for another.

The price is the lowest consistent in keeping with the above standards. Our production is such that immediate delivery can be made.

You need one? Order now!

Simmons Machine Co., Inc., Albany, N. Y.

New York, 1001 Singer Bldg. Detroit, 804 Dime Savings Bank Bldg
Buffalo, 358 Ellicott Square

Marschke "Economy"
Motor Driven Grinders
For Alternating or Direct Current



Direct Current
"Economy" Grinder

110 or 220 Volt
(See Illustration)

Motor, 2 h. p.
Emery wheel, 12" x 1½" or 2".
Emery wheel collars 5½" x 1".
Length of arbor, 26".
Arbor where wheel goes, 1" diameter.
Center of arbor to floor, 39".
Base on floor, 20" x 23".
Speed full load, 1,600 r. p. m.
Motor entirely enclosed.
Journal self-aligning S.K.F.b.b.
Automatic oil switch and starter.
Exhaust fan, 6" x 2".
Exhaust fan bearing, S.K.F.b.b.

We confidently assert that the Marschke self-contained "Economy" Electric Grinder, for either current, is unequalled in its combination of ease of installation, simplicity and quickness of operation, and in the accuracy and economy of its results.

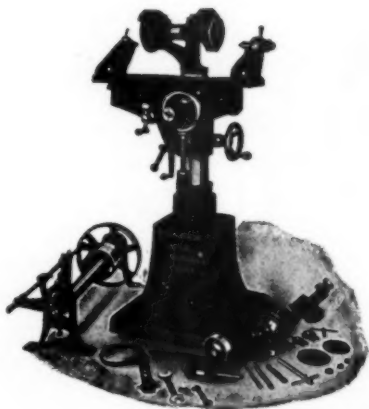
Starts in four seconds—simply set foot on pedal. Stops instantly. You should have the complete description for an enumeration of its many excellent special features.

May we send the descriptive folder?

Marschke Manufacturing Co.
Indianapolis, Ind.

Grand Rapids No. 1

Universal Cutter, Reamer
and Tool Grinder



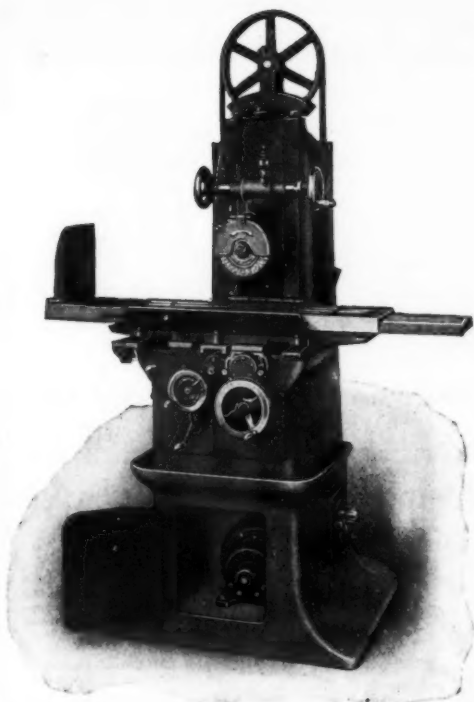
Simple in Design
Efficient in Service
Accurate in Workmanship
Economical in Cost

Ask for bulletin giving full particulars

Grand Rapids Grinding Machine Co.

17 Ottawa Ave., N. W.

Grand Rapids, Michigan, U. S. A.



The Abrasive Surface Grinder

For Improved Grinding in the Tool Room

Not a slight modification of existing types, but an entirely new model of greatly superior design and construction, fully 50 per cent heavier than any other machine of its type. May we send specifications?

Abrasive Machine Tool Co.
East Providence, R. I.

Cut Your Grinding Costs

Not only in initial outlay but in general shop grinding practice. The **National** is the easiest to set up, will do anything any other grinder will do and many things no other grinder can do. Can be used for external or internal grinding (motor never in the way) on lathe, shaper, milling machine or planer. Unexcelled for grinding Cutters, Arbors, Reamers, Mandrels, etc., between centers, on small or large lathes. SKF ball bearings thruout.

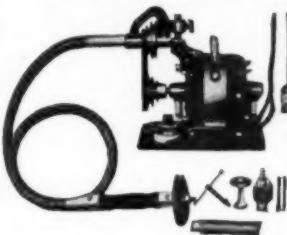
The **National** is the grinder you have been waiting for. Send for circular and full details. Sent on 10 days' trial.



National Machine Tool Co.
Racine, Wisconsin

An Indispensable Money Saver

"Strand" Flexible Grinder for Every Shop



Big shops and little shops both have use for this portable grinder. It is *indispensable* as a time and money saver.

The *Strand* shafting is the most flexible made. Friction is reduced to an absolute minimum, and the wear on shaft is negligible. It automatically prevents bends. End connections are strong as shaft itself.

Our several types and sizes are the result of 15 years' practical experience. Write for Circulars

N. A. STRAND & CO., 625 W. Jackson Blvd.,
Dept. H, CHICAGO

W & M No. 1 Universal Grinder



A Perfect Tool Room Machine.

Centers swing 10" diameter 30" long.

Circular on request

Wilmarth & Morman Co.

Master Grinder Makers

1185 Monroe Ave., N. W., Grand Rapids, Mich., U. S. A.

Cuts the Time More Than Half



*More
than
20,000
Outfits
in use
today!*

STOW FLEXIBLE SHAFT NO. 4, with $\frac{1}{2}$ h. p. motor, driving a 6" wire brush on sheet aluminum auto body, which conditions the metal to take a good coat of paint. Will also grind, ream and drill. Exceptionally convenient. Write for description.

STOW FLEXIBLE SHAFT CO., 26th & Callowhill Sts., Philadelphia, Pa.

Ott Grinders

Combine the essentials of
ACCURACY and **RIGIDITY**
with **SIMPLICITY** of design

Simplicity accounts for their price, and for
their popularity among good operators.

5"x18" Plain—10"x32" Universal—6"x6" Internal

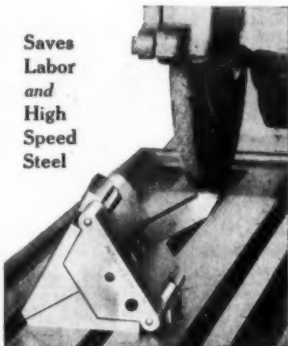
Ott Grinder Company

200 West Tenth St., Indianapolis, Ind.

Quick Grinding with a Boss Jig

It has no equal for holding thread cutting tools while grinding 29 degrees acme, or 60 degrees U. S. Standard, or any degree between 29 and 60

**Saves
Labor
and
High
Speed
Steel**



The slotted screw in center of face controls the various angles required by turning, which causes the hinged wings to move in and out.

Clearance on thread tool is automatically provided for as the hinged wings are offset the correct degree to produce clearance.

Has containers for 3/8" and 5/16" tools; also furnished in special sizes.

The thread tool is accurately ground on both sides and top without removing from the Jig.

Retail price \$15.00, delivered anywhere in the United States. We shall be glad to quote terms to jobbers upon request.



We solicit a trial order now—you'll order more later

G-L Sales Company

Sole Distributors

521-523 W. 26th St., New York City

Snap Gauges Superseded

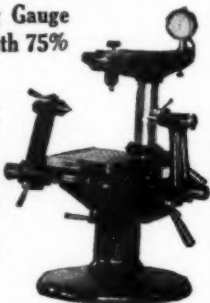
Our Universal Amplifying Gauge enables you to dispense with 75% of your snap gauges

When the Universal is set, the parts can be gauged as fast as the workman can handle them. The saving is obvious.

You can adjust it in a few minutes for any size piece up to $5\frac{1}{2}$ " on the plate, and 8" between centers.

Used by U. S. Government; is especially valuable where Swedish gauge system is used.

Catalog No. 100 explains fully



THE NORTH SIDE TOOL CO., Dayton, Ohio

Manufacturers of Special Tools, Dies, Jigs and Fixtures



For inspection work where limits are close and accuracy and speed essential

1. Measuring Plug Gauges in readings of - .0001
2. Measuring Interchangeable Parts in readings of - .0001
3. Measuring Drill Jig Bushings in readings of - .0001
4. Measuring Pistons in readings of - .0001
5. Measuring Ball or Roller Bearings in readings of - .0001
6. Testing Concentricity of Form Milling Cutters - .0001
7. Testing Concentricity of Spindles of various designs - .0001
8. Settling Shop Disputes over Micrometer Readings
9. Speeding up Production Gauging

Any attachments to suit your needs
The Davie is Standard Throughout America and Europe

22 in use in The Ford Motor Plant Alone

Send for catalog

Davie Gauging Machine.
Graduations in .0001
Height 17" — Length 15" — Width 9"

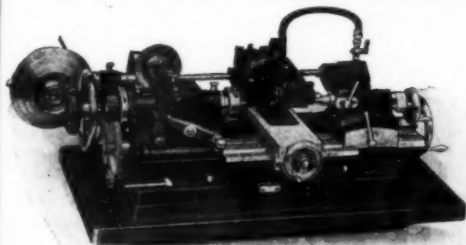
BURTON, GRIFFITHS & CO., Ltd.
Ludgate Sq., Ludgate Hill, London, E.C.
Agents for Great Britain
SOC. ANONIMA ITALIANA ALFRED HERBERT, Milan, Italy. Agents for Italy

The Davie Tool Co.
E. 118th & Euclid Ave., Cleveland, O.

SOC. ANONYME ALFRED HERBERT
47 Boulevard de Magenta, Paris
Agents for France

One Operator Runs Several

As a Manufacturing Machine the
Waltham is Speedy and Economical



THE COMPLETE WALTHAM is for universal use, especially in tool rooms and experimental departments. When used as a single purpose machine for manufacturing work, diverse parts may be omitted, which reduces the cost in proportion. For such manufacturing operations one unskilled operator can run several of these thread milling machines.

For certain threads a multiple cutter may be used, and a complete thread produced in *one revolution of the work*, thereby greatly increasing production. It swings 3" over carriage. Length of thread cut if work is held on centers, 6"; if one end is held by a spring chuck, 7¼". We can also furnish a longer machine and floor stands to which standard motors can be attached.

Send us samples or blue prints of your work
and we will gladly make a production estimate,
and give advice as to the proper equipment.

Waltham Machine Works
Cutter & High Sts., Waltham, Mass.

Case-Hardo

**The ideal, quick acting, non-poisonous
case hardening compound**

It is ideal because it produces a glass-hard surface, of a good color, with deep penetration.

It acts quicker because less heat is required—only about 1400 degrees Fahr. when used in any cyanide furnace.

It saves labor, fuel and time, it costs less, and a given quantity will harden more work—hence the economy is obvious. Being so constructed as to throw off no poisonous gases, the men work in perfect safety. Write us for information and prices.

Made Only By

The Thos. Buchanan Company

29 W. 3rd St.,

Cincinnati, Ohio

Established in 1886

CASE HARDENING MATERIALS

If you are using a lead bath for tempering you should use our

"CLEANCOAT"

on top to protect the lead from the air and brush off the lead from the steel in withdrawing it from the bath.

CHEAPER THAN CHARCOAL, HAS NO ASH

Try it. We will give you enough to cover your lead pot.

Bell & Gossett Co.

613 W. 30th St.,

Chicago



Why Does It Win?

Produces a Better Case—that's why

A better case because it is deeper and cleaner, and results are always uniform under similar conditions of properties of steel, temperature, length of exposure and quenching. The constancy of Ferro Case composition eliminates all uncertainty as to dependable work.

Economy

Ferro Case carbonizes at a lower temperature, and not only reduces first cost for material, but saves labor, time and fuel. It avoids crystalization, warping, blistering and wear on furnace linings, due to excessive heat. It does not deteriorate with age, making it safe for you to stock up freely.

Safety

Last, but not least, Ferro Case is safe. It is non-poisonous, and after one trial cyanide will be taboo in your plant forever after.

Ferro Case M is for use in the cyanide melting furnace, and is handled the same way.

Ferro Case S is for sprinkling on hot steel. Kindly state the grade desired.

*We solicit a trial order—repeat
orders take care of themselves*

C. G. Buchanan Chemical Co.

Sta. H., Cincinnati, Ohio, U. S. A.

Castellating Machine



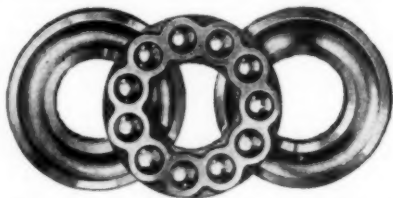
Production on one-fourth to one-half inch Nuts

400 to 700 per hour

Does a clean, accurate job.

Enquire of your dealer or write us for full details.

THE CRAFTSMAN TOOL CO.
CONNEAUT, OHIO



BEARINGS

LIGHT DUTY

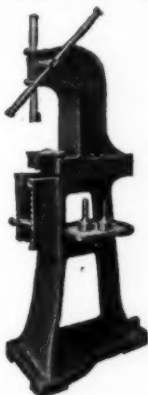
HEAVY DUTY

ALL TYPES

Send for 1919 Bulletin giving standard dimensions

THE GWILLIAM COMPANY
253 WEST 58th ST., (at Broadway), NEW YORK

Nicholson Products are Guaranteed Products



Nicholson Arbor Press No. 3 with stand and drivers.

Note adjustable shelf for any length arbor or press.

Capable of exerting a pressure of 6,750 lbs.

The Arbor Press That Does the Work Quicker and Better

The elimination of lost motion is the secret of factory production. Doing the work quicker and better means greater output and decreased overhead costs.

Nicholson Arbor Press "Knocks it out in a Jiffy"

Not only does the "Nicholson" save workmen's time, but it also saves many bushings, shafts, pinions, arbors, etc., which would otherwise be destroyed by use of a sledge.

The "Nicholson" is constructed of highest grade materials. It is designed to withstand years of service and is the last word in arbor presses.

A Nicholson Arbor Press will be installed in your plant for 30 days' trial. Unless it proves an investment to you, return it at our expense.

W. H. Nicholson & Co.

117 Oregon St., Wilkes-Barre, Pa.

Increase Output—Save Man Power



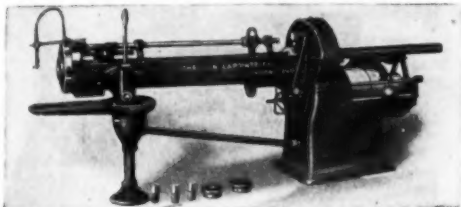
The Etna Rotary Swager

is a machine with great possibilities. Many plants have replaced hammers with the "Etna" and have *increased production 5 to 10 times*. It is capable of continuous, unrelenting hard work, and will *outlast any other swager built*.

Made in regular sizes to swage $\frac{1}{4}$ to $4\frac{1}{2}$ in. diameter. Our Catalog shows some interesting things. Why hesitate?

The Etna Manufacturing Co., TOLEDO, OHIO

**This is only one of the
11 TYPES — 5 SIZES
Ask for a complete catalog**

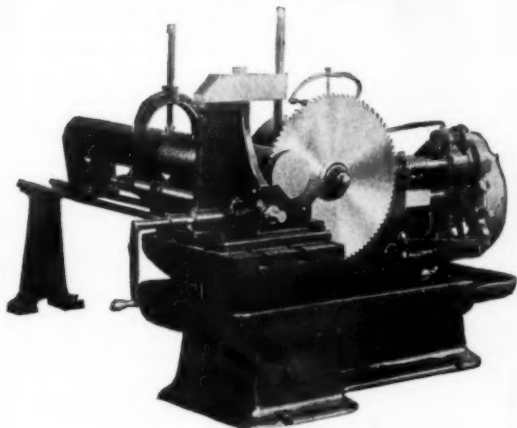


J.N. LAPOINTE CO.
NEW LONDON, CONN.

Makers of Broaching Machines and Broaches.

No. 6 Metal Sawing Machine

Built Like a Machine Tool



CAPACITY

8½" Rounds
7½" Squares

12" I-Beams
7x10" Billets

WILL CUT IN MULTIPLE

34 Bars, 1" Diameter	8 Bars, 2½" Diameter
19 " 1½" "	4 " 3" "
8 " 2" "	4 " 3½" "

TWO Saw Speeds for hard and soft stock.

FIVE changes of feed for each saw speed.

Feeds from 3-16" to 2" per minute.

Automatic Feed.

Automatic Return of Carriage.

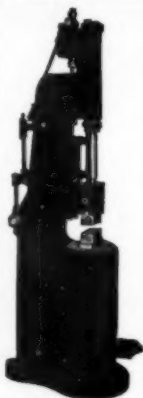
Rack and Pinion Stock Feeding and Gauging Device.

Four other sizes; also Automatic Saw Sharpening Machine.

Catalogue

Cochrane-Bly Company

Rochester, N. Y., U. S. A.



It's Portable

The Barr Pneumatic Hammer

Is recognized today by progressive shop men as the ideal light power hammer!

A tool which should be in every up-to-date shop and tool room. A tool which repays its cost in short order and which you will truly appreciate every day you own it.

Expertly designed—exceptionally well built—simple—economical and dependable. Installed just where you want it, without expense of foundation, belts, shafting or motors.

Readily moved right to the job inside or outside.

Write for Bulletin 10H.



Fairbanks-Dupont Power Hammers

25 to 300 lbs.

Belt or Motor Drive

**These Hammers Embody
a Design and Workman-
ship that are Unsurpassed.**

Send for Catalog

United Hammer Co.
Oliver Building, Boston, Mass.

Automatic Stock Feed, Draw Cut
Marvel No. 5 High Speed Saw

**Equals 8
Ordinary
Hack Saws**



Cuts up the bar into duplicate pieces to the length desired automatically without attention of operator. The most complete combination of speed, economy and accuracy ever made. In tests made at extreme feed pressure at 145 r. p. m. it cut 5" round cold steel in 8 minutes and 6" in 10 minutes. Furnished motor driven if desired.

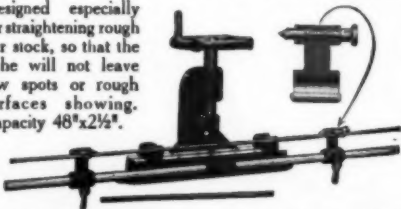
A "Marvel" in name and in fact. Shall we mail full description?

Armstrong-Blum Mfg. Co.
341 N. Francisco Ave., Chicago, Illinois

Remove All Bends and Kinks

From bar stock before it is put in the lathe

Designed especially for straightening rough bar stock, so that the lathe will not leave low spots or rough surfaces showing. Capacity 48"x2½".



Repair work also done on bent journals, shafting, axles, etc.
Special work done, as bending and pressing tubing, axles, etc.

You are under no obligation if you write

JOHN T. TOWSLEY MFG. CO., 1837 Woodward St.,
CINCINNATI, OHIO

You Make Money Every Minute

You Operate This Abrasive Metal Cutter

If you want to do high-grade work at the lowest possible cost, Peter Bros. Abrasive Metal Cutter will be invaluable to you. It will cut a square bar up to ¾" in less than one-fourth the time required to nick and break it. Works quicker, better and 75% cheaper.

8" Size \$22.50, with C. S.
Splendid for tool room. Cuts high-speed steel up to 1" square.

12" Size \$60, with C. S.
Cuts up to 2½" diameter, round or square, at any angle up to 45 degrees. Ball bearing.

15 Days' Free Trial

Write us or ask your dealer

PETER BROTHERS MFG. CO.
115 Railroad St., Algonquin, Ill.



Essential Economy



The "Racine"

High Speed Metal Cutting Machine

is in operation in all plants where economy of operation is carefully investigated.

It saves blades, saves material, saves time and labor. 30 different types.

Catalog "H" will be sent on request

Racine Tool & Machine Co.

Racine, Wisconsin, U. S. A.

Genesee Hollow Mill

Cuts at Rate of 12" to 15" a Minute
Adjustable, and Stronger than Solid Tools



Its adjustable features give it the range of hundreds of solid tools.

The Genesee never clogs up with chips and cannot change in size. It is adjustable to 1,000th of an inch in a few minutes.

One set of blades outlasts three to five solid tools, and can then be replaced at small cost.

Only 14 sizes cover the entire range from $\frac{1}{4}$ " to 2", doing the work of hundreds of solid tools. They increase output and save time.

If interested in rapid production, get in touch with us — our engineers are at your service

Genesee Manufacturing Co., Inc.
Rochester, N. Y.

Manufacturers of Adjustable Hollow Mills, Facing Tools, and
Inserted Tooth Face and Side Milling Cutters

To cut metal 50 to 100% faster means
that you also greatly cut costs



Peerless **HIGH SPEED**

—Heavy Duty Metal Cutting Saws reduce costs in more than one way. You obtain 50 to 100 per cent *more work* with the same number of machines, or you accomplish the *same amount of work*, with fewer machines. In the latter instance you save in investment, in attendance and in floor space.

One of the very valuable features of the "Peerless" is the balanced lift, which automatically raises the blade for the return stroke. This frees the teeth from strain and wear, prolongs the life of the blades, and saves power. Compared with other machines, the Peerless saves money at every stroke.

*We will help to make this economy your own by
sending you one on 30 days' trial*

Peerless Machine Company
1609 Racine Street, RACINE, WISCONSIN

Partridge Light Punch Press

For making novelties from sheet metal, including such operations as stamping, blanking, piercing, bending, forming, perforating, embossing, shearing and wire cutting. Has exceptional strength for its size.

Carefully adjusted to secure accurate working of the dies, and to prevent shearing. Pendulum action of lever gives a stroke of maximum power without tiring operator. Workmanship and material the best.

Write me for the interesting price

E. O. PARTRIDGE, 2041-2049 CHICAGO

Also Bench, Column & Cabinet Grinders, Polishing Lathes, Light Punch Presses, Hollow Mills, Countershafts, Chuck Arbors and Saw Mandrels



See These Intricate Patterns?

You Can Cut Them Cheaply and Accurately



The New Gray's Sheet Metal Cutter (NOT a Rotary Shear)

Cuts any conceivable shape without springing or buckling—leaves material in perfect alignment. Transforms expensive hand-work into an easy, economical, mechanical task. *In a class by itself.*

Respective capacities of Nos. 0, 1, 2 & 3:

18"	throat,	1/8"	plate
34"	"	3/16"	"
36"	"	3/8"	"
36"	"	5/8"	"

Make us prove up. You will be more than pleased.

W. J. SAVAGE CO., Knoxville, Tenn.

Our Pipe Benders Meet The Demand



Ever since their invention our hand Pipe Benders have had a steady sale and have given universal satisfaction.

Recently, we have made some improved attachments that permit of a wider range of work and open up a new field in the kind of bending the machine will accomplish.

If you do pipe bending you will find our machine an economical, simple and very efficient appliance in reducing costs and doing better work. For 2" and under.

We have a Bulletin waiting for you. Send for it now.

Pedrick Tool & Machine Co.

3644 N. Lawrence St., Philadelphia, Pa.

Manufacturers of Cylinder Boring Bars, Portable Millers, Crank Pin Turning Machines, etc.

"QUICKWORK"

Registered in U.S.A. and Foreign Countries

Rotary Shears

Made in 7 Sizes

Cut all gauges of sheet and plate metal up to 1 inch thick in straight or irregular shapes and openings without cutting in from side of sheet. Leaves square, true edge that requires no finishing. Used in building ships, boilers, tanks, cars & general plate and sheet metal work.

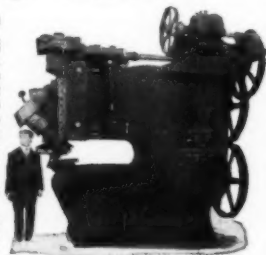
Save 50 to 90%

Eliminates Oxyacetylene cutting and plate planing

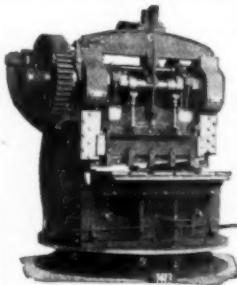
Write for catalogue No. 60

Patented June 3rd, 1913

THE QUICKWORK COMPANY, St. Marys, Ohio, U. S. A.
Cable Address "Quickwork," "W. U." and "General" Codes



From Smallest to Largest Size



of Power Punches and Shears is included in the famous

"Quality Line"

of machinery. We've been building 'em for over 50 years.

The picture shows our No. C motor-driven Gate Shear, 62" between housings, 18" throat, for plates up to $\frac{7}{8}$ ". Made any width between housings from 24" to 120", with 8" to 36" throats. It may be turned by hand in any direction to save handling the work.

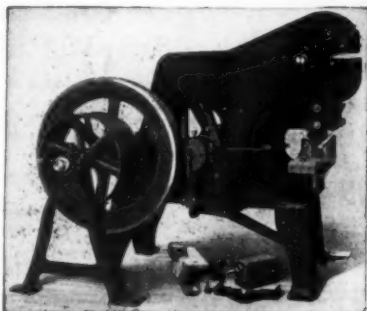
Write for fully illustrated
300-page Catalog 21-A

The Long & Allstatter Company

AMERICAN PUNCH AND SHEAR WORKS

Hamilton, Ohio

Punches—Shears—Bending Rolls
The Beloit
Combined Power Punch And Shear



Built in six sizes. Nos. 51, 52, 53, 54, 55 and 56

Direct connected motor or belt drive

This is the best all around punch and shear in a combined machine of moderate cost. It is heavy and substantial, and amply back geared to require the minimum amount of power; is strong, compact, and easy to operate. Can be equipped with angle shearing attachment, architectural jaw, or for special work.

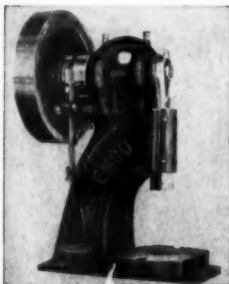
We are putting out a complete line of punching and shearing machinery in both power and hand tools, also light and heavy duty bending rolls.

We do not overrate the capacities of our machines.

Write for catalogue and prices

Hendley & Whittemore Co.
100 S. State St., Beloit, Wis.

Emco Bench Press



EMCO "W" Bench Pwr. Punch Press

Weight, lbs.,..... 130
Stroke, --- $\frac{3}{4}$ " or $1\frac{1}{4}$ "
Capacity, --- $\frac{3}{4}$ "x1-16"

For rapid production on Small Parts

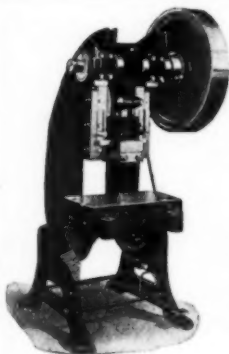
Used in quantities by many large operators.

Specials—Iron Stand, Die Block, Inclining Blocks, Motor, Counter.

Absolute non-repeat stop on one stroke.

Made absolutely accurate for die and other fine work.

The Enterprise Machinery Co., 28 S. Clinton St. CHICAGO, ILL.



Simple—Rigid L-J Inclinable Power Presses

Unexcelled for economy and accuracy. Their simplicity and rigidity of construction insures long and constant service with a minimum of expense for upkeep.

Our Dealers

Stocker-Rumely-Wachs Co., Chicago
W. J. Baird Machinery Co., Detroit
Herberts Machinery & Supply Co.,
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J. L. Lucas & Son Inc., Bridgeport, Conn.
Brown-McDonald Mch. Co., St. Louis
Northern Machinery Co., Minneapolis
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Patterson Tool & Sup'y Co., Dayton, O.
Dale-Brewster Mch. Co., New York
Swind Machinery Co., Philadelphia, Pa.

Write to the nearest, or

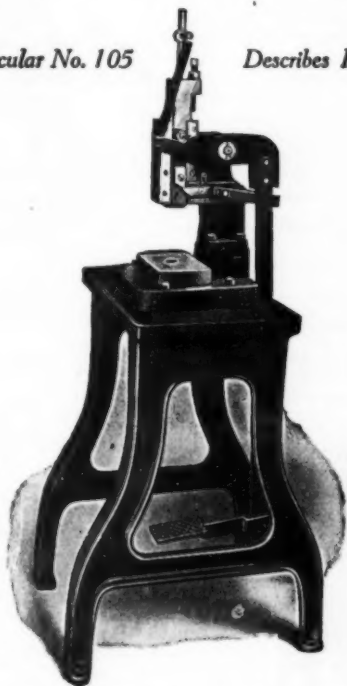
Loshbough-Jordan Tool & Mche. Co.
Elkhart, Indiana

Spring Foot Press No. 105

Uniformity of Blow Vibrationless Non-Fatiguing

Circular No. 105

Describes It



The Taylor & Fenn Company
Hartford, Conn.

Accurate—Powerful—Durable
Willard Power Press
Inclinable Open Back

Designed for hard, continuous service. Combines in construction features of originality and up-to-date improvements. Adapted to all kinds of blank cutting, punching, perforating, forming and bending of sheet metal. A superior type of press for general manufacturing purposes.

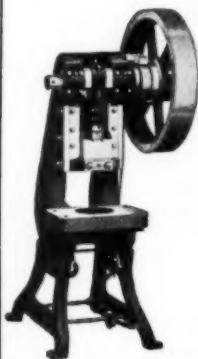


Now is an excellent time to write

The Willard Press & Tool Co.
 Cincinnati, Ohio

Here Is A Press

With Plenty of Steam
Back of THE PUNCH



HIGH DUTY
ROCKFORD
PUNCH PRESSES

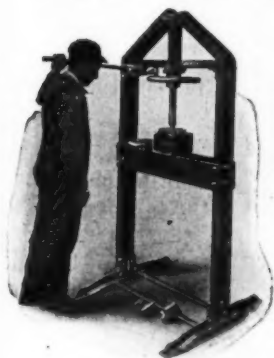
Made in straight side and inclinable types. Their great power backed by rigid design enable them to do the work you demand and stand up to it.

Write For Catalog

Rockford Iron Works
 Rockford, Ill.

WEAVER

20-Ton Press



A
Forcing Press
Operated by
Man Power
That Will
Meet Your
Demands Up
To 20-Tons
Pressure

One Man = 20-Tons Pressure With a Weaver 20-Ton Press

The WEAVER 20-TON PRESS, while designed particularly for the Garage, is meeting equally as large a demand from Machine Shops, Electric Shops and Factories, because of its extraordinary capacity and enormous power.

Construction:—

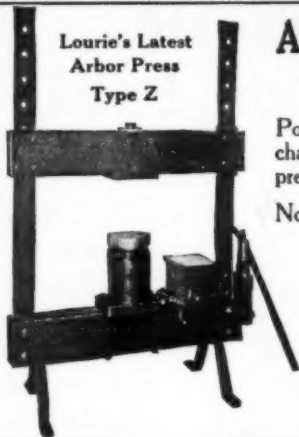
The frame is of ONE PIECE 5-inch, 9 pound channel steel, 32" wide between uprights, rigidly braced by a solid truss construction at the top, without bolted or riveted corners, or connections to weaken it. The screw does not revolve and is equipped with a "QUICK RELEASE" mechanism, that instantly releases the pressure when operated.

*For complete description write for Catalog
List price F. O. B. Springfield, Ill., \$85.00*

Special presses of extra width can be furnished at a nominal charge

Weaver Manufacturing Co.
2179 So. 9th Street, Springfield, Illinois

**Lourie's Latest
Arbor Press
Type Z**



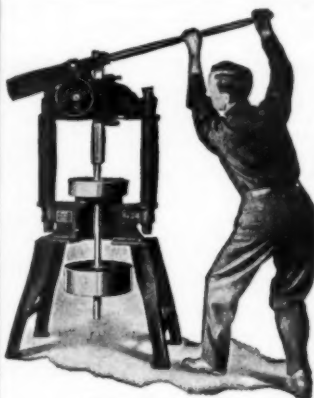
**Adjustable
Crosshead**

Position quickly
changed by hydraulic
pressure.

No heavy lifting.

**For Garage
or
Machine
Shop**

**Lourie Mfg. Co.
Springfield, Ill.**



No. 24 Press

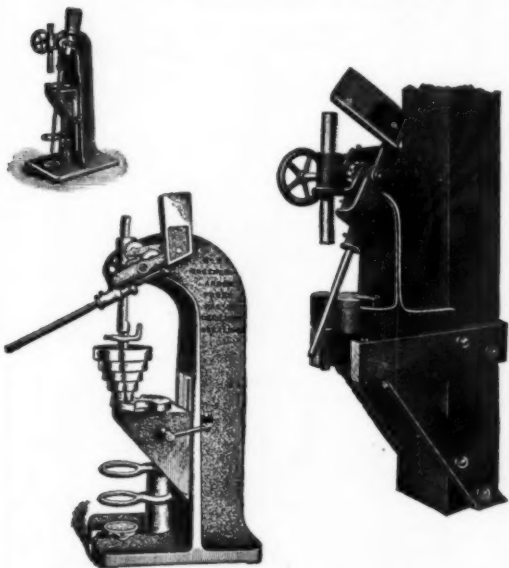
**Efficient
Equipment
Atlas Presses**

for building and repair-
ing automobiles and
general machine shop
operations requiring
pressure up to 25 tons
and centering capacity
up to 36 inches.
For driving mandrels;
bending and straighten-
ing, broaching, emboss-
ing with dies, setting
bushings and many
other every day manu-
facturing jobs, there is an
Atlas Press. All sizes
for all purposes. *It will
pay you to investigate.*

Atlas Press Co.
317 N. Park Street,
Kalamazoo, Mich., U. S. A.

Your Choice of Arbor Press

From 15 Lbs. to 40 Tons Pressure



GREENERD ARBOR PRESSES made good before and during the great war, and they will continue to make good in the strenuous years ahead of us. The fact that we are kept busy serving an ever increasing number of customers is proof that the superior convenience of Greenerd Presses is appreciated. They save time and money wherever installed.

Make sure of this sure economy by writing today

Edwin E. Bartlett, Nashua, N. H.

Tucker's Safety First

Oil Hole Covers

Require but one hand to pump in the oil. Adapted to all kinds of mechanism having oil holes leading to a bearing, and locate the parts to be lubricated.

*Send for Catalogue
Oil Hole Covers No. 5*



Style G, Closed



Style G, Open



Style C



Style F, Drive



Style A



Style B



Style D, Open



Style D, Closed



Rotary Head

W.C. & F.C. TUCKER, Hartford, Conn.

Riveting Revolutionized

"The Hammer with the human stroke"

Heads Rivets Cold



Heads 'em tight or loose, flush, countersunk, or finishes heads any shape desired at the rate of:—

A rivet a second, sizes up to 3-16 in.

A rivet in two seconds, sizes 1-4 to 3-8 in.

A rivet in three seconds, sizes 7-16 to 5-8 in.

Built in Eight Sizes

To handle rivets from the smallest, up to 1½" in diameter. Send us sample assembly parts with rivets or sketch of your work, and let US shoulder your riveting problems.

Send for the High Speed Hammer Book

Department 13

The High Speed Hammer Co., Inc.

Rochester, New York

Saves Time of Resetting

Universal Angle Plate Gives
Instant, Correct Adjustment for
Milling, Boring and Grinding



Protected
by Patents

8"x10" Worm Adjusting—Made in Four Sizes

THE COST OF YOUR PRODUCT is determined largely by the amount of time spent on it—hence the big saving made possible with the Universal Angle Plate. It can be used on any machine tool.

Tapers may be ground, and formed cutters ground by the addition of centers to platen. Several angles may be planed, shaped or milled on one piece with accuracy. It's the most convenient attachment for the die sinker made in years. It moves thru a complete circle horizontally and 90° vertically, and has a vernier attachment reading to 5' for especially accurate work.

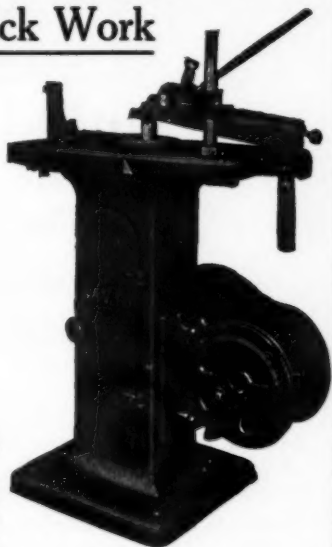
*Here's an opportunity for real economy. Begin making
it your own by writing us today for full data*

Boston Scale & Machine Co.

100 Ruggles St.,

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Modern Methods for Quick Work



A DAVIS KEYSEATER

Motor driven,
will save you
valuable space
as well as in-
crease your pro-
duction. It is
an investment
you can't afford
to overlook.

Write for Circular

DAVIS MACHINE TOOL CO., Inc.
ROCHESTER, N. Y., U. S. A.



Terrell's Steel Lockers Are Fireproof, Sanitary, Secure

STEEL LOCKERS are a necessary equipment in all buildings where persons require individual receptacles for storing garments or sundry articles.

Fireproof lockers greatly lessen the fire-hazard of your plant. In some states they are required by law.

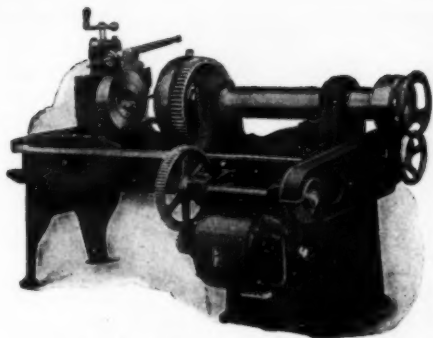
Sanitary lockers are steel lockers. Wooden lockers are easily accessible to various kinds of vermin.

Secure lockers breed contentment among the workmen, for they know their belongings are safe against meddlers and thieves. Terrell's Steel Lockers are unexcelled for strength, durability, and economy.

Write today. You'll obligate us—not yourselves

Terrell's Equipment Company

Hall & Division Sts., Grand Rapids, Mich.



(No. 3 Peerless. All Gears are Covered)

Bignall & Keeler Pipe Machines

Some points of excellence pointedly given—

- ¶ They are equipped with a gear box drive for obtaining the right threading speeds.
- ¶ All uncertainty or guess work in selecting the right speed for threading each size of pipe is positively eliminated.
- ¶ Dies can be changed without removing a screw.
- ¶ Die slot can be cleaned without removing the cover.
- ¶ A rotary oil pump supplies oil to dies and cutting-off tool.
- ¶ Pump is gear driven—no belt to soak up oil.
- ¶ All B. & Ks. have the Peerless adjusting mechanism.
- ¶ The larger machines have two gripping chucks.
- ¶ You have 17 styles and sizes to choose from.
- ¶ You make no mistake in sending your inquiry to us now;

at

EDWARDSVILLE, ILLINOIS

Bignall & Keeler Machine Works

CULLMAN SPROCKETS

STOCK AND TO ORDER



Diamond, Whitney, Baldwin, Duckworth and
Coventry Chains, Block, Roller and
High Speed Silent types on hand

CATALOG



CULLMAN WHEEL CO.,
1359 ALTGELD STREET

CHICAGO



From Safety Razors to Tractors

NIVIN
METAL PARTS WASHING MACHINE

**Washes Metal Parts of All Shapes
and Sizes at Half the Cost and Time**

THE International Harvester Company and the Gillette Safety Razor Company are two of the many plants with widely different products which have proved the immense economy and efficiency of the NIVIN Metal Parts Washing Machine.

The Nivin reduces washing labor costs more than one half. It uses no gasoline, thus ending fire risk. NIVIN washed pieces are always perfectly clean—the Nivin never tires, never loafs. Nivin handles work of any size in half the time of hand labor. Nivin units fit into any factory system.

A Few NIVIN Users

Hoover Section Sweeper Co.
Wm. A. Rogers, Ltd., Silverware
International Time Recording Co.
Edison Phonograph Works
Columbia Phonograph Co.
Gorham Mfg. Co., Silversmiths
Buffalo Forge Co.
Wollensak Optical Co.
Stromberg Motor Devices Co.

Burroughs Adding Machine Co.
Nash Motor Co.
Studebaker Automobile Company
Fafnir Bearing Co.
Sargent & Co.
Builders and Cabinet Hardware
Olds Motor works
Cleveland Hardware Co.
Geneva Cutlery Co.

Write for Literature

Your name on a card or on your letterhead will bring descriptive literature giving full details of the operation of the NIVIN. This information is valuable to you. It puts you under no obligations to ask for it. Write for it today.

The Nivin Mfg. Co., 843 Larrabee Street, Chicago



Are You Looking For Hobs?

Our line of "Quality Tools" consists of only the highest-class tools, both in material and workmanship. Every step in their manufacture is under constant inspection. All tools are *exactly* right before they leave our plant.

For Milling Cutters?

No milling machine is better than its cutting tools. Michigan cutters insure accuracy, more production and cutter economy.

Special Tools?

Our tools cut smoothly and accurately, and are distinguished for *quality*. Do you need *good* cutting tools?

Drop us a line now

Michigan Tool Company

Detroit, Mich., U. S. A.



Straight Shank Turning Tool



Boring Tool



Straight Shank Cut-off Tool

Armstrong Tool Holders

Make One Pound of High Speed Steel go as far as Ten Pounds in Forged Tools.

Grand Prize Winners at Panama-Pacific Exposition.

Complete Catalog Free.



Armstrong Bros. Tool Co.

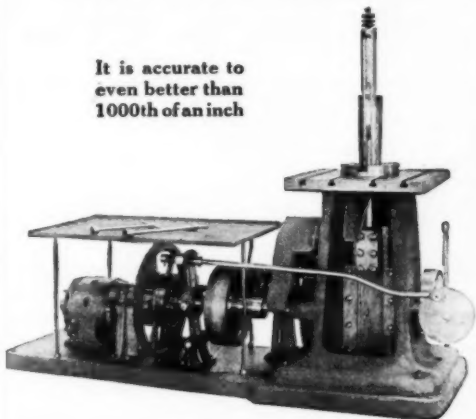
"The Tool Holder People"

308 N. Francisco Ave., Chicago, U. S. A.

Fast Keyseating Lowers Costs

And the "Catlin" Leads 'Em All

It is accurate to
even better than
1000th of an inch



THE SPEED and efficiency of the Catlin is in part due to its great simplicity—it has less than half the parts of any other make. The work is instantly and exactly centered by the bore, and the keyseat is accurately cut with proper taper, whether hubs are finished or not. This permits duplicate keyseats to be cut to one-thousandth of an inch without special tools or special skill. Hubs do not even have to be faced.

Big plants in all parts of the country, including automobile factories and U.S. navy yards, are satisfied users of the Catlin. It does quicker work and invariably lowers costs

A large folder which explains fully and contains interesting production records, is yours for a postal. Address

Chattanooga Machinery Company
Chattanooga, Tenn.

ELECTRIC EUCLID HOISTS

Let OUR Engineers Save YOUR Time

It is possible that you realize the need of modern material handling equipment but cannot spare the time or men to work out the details.

Our engineers are constantly solving these difficulties and helping manufacturers reduce expenses.

Furthermore, this service is absolutely free.

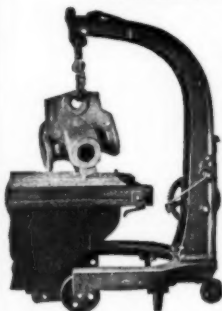
Will you take advantage of it?

The Euclid Crane & Hoist Co.

Dept. C

EUCLID, OHIO, U. S. A.

Are You Paying For a Canton Crane Without Having One?



You are losing money every day you operate without a "C. C." — "*The Handiest Tool in the Shop.*" It will enable you to keep your first-class mechanics at their work instead of taking from five to nine of them to aid in every odd job of lifting and lugging.

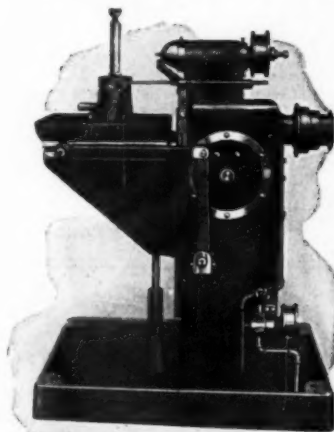
The "C. C." is just as useful for light weights as heavy ones. One man can operate it quickly, with perfect ease and safety, and at a great saving to you. It goes into every nook and corner of a factory. No user would part with it for twice its cost if he could not get another. Why not investigate it, and stop much needless expenditure?

Ask for Booklet E-8 when you write
Your choice of many sizes

CANTON FOUNDRY & MCHE. CO., Canton, O.

Perfect

**Gear Tooth Rounding
At Much Less Cost**

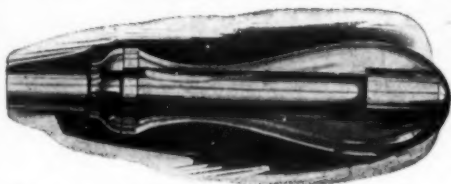


The CROSS Gear Tooth Rounder

Is guaranteed to round 24 teeth per minute, any pitch $\frac{1}{2}$ or finer, and every tooth a perfect half circle—the only perfect form for sliding mesh gears. Yes, that's revolutionary—but it's true—and we guarantee it.

Cross Gear & Engine Company
Detroit, Michigan

Patented here and abroad; sold ONLY by us



Quick Action

This is what we call this new Machine Handle. Attached to any power tool, especially the heavier types; adjustments are made with more speed and less effort.

All kinds of standard and special Handles from steel for power tools and similar purposes.

Send for Catalogue and prices.

The Cincinnati Ball Crank Co.
Oakley, Cincinnati, Ohio



Style "C"



The Hinge



Style "Y"



Style "B"



Style "G"



Style "O"



Style "L"



Style "T"

GITS OIL CUPS

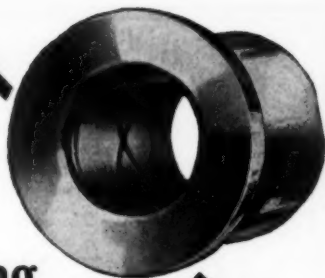
Give perfect satisfaction where others fail. State style and size in which you are interested, and we will send free samples and catalog.

GITS BROS. MFG. CO.
1940 SO. KILBOURN AVE., CHICAGO



Style "H"

We Are Bushing Specialists



Because we are specialists, our finished ready-for-service Bushings are better. Also, they cost you less. And usually we can supply you in less time than it takes you to make your own, involving patterns, castings and special machining.

*Consult us whenever you need
plain or babbitted bearings*



**The Bunting Brass
& Bronze Company**

754 Spencer St., Toledo, Ohio



Conserve Time With Dependable Tools

T. H. L. Punches

are a rugged help in increasing production, and you can absolutely depend on them to "deliver the goods."

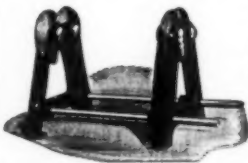
The correct steel is employed in their construction, and you can "bank your bottom dollar" on the fact that they will give maximum results, smoothly, quickly, and accurately.

Prompt shipment of all regular sizes; special sizes on short notice.

A trial order will convince you

T. H. Lewthwaite Machine Co.
415 East 31st St., New York City

Exceedingly Sensitive Anderson Improved Balancing Ways Always Ready—Easy to Manipulate



Designed especially for balancing cutter heads, crank shafts, aeroplane motors, propellers, polishing wheels, cones, pulleys, gin brushes, armatures, rotors for turbines, etc.

Anderson Balancing Ways are extremely sensitive—a quality absolutely essential to proper balancing. They require no adjusting.

Five sizes, for parts up to 10,000 lbs. weight, cover all requirements.

Your inquiry is most cordially invited

Anderson Bros. Mfg. Co.
115 Morgan St., Rockford, Ill.

George A. Lewthwaite Punches And Dies



Efficient—Dependable

The experience and care which go into their construction are demonstrated in the work they do in all metals and on all makes of machines. Users swear by them, because they deliver the goods—so will you when you try them.

Lewthwaite Shear and Rod Cutter

This handy tool is compact, convenient and easy to operate. You will find it just right for many jobs in your shop, for it has power to do easily shearing and cutting even beyond its rated capacity. It will earn its cost in a comparatively short time.

Also

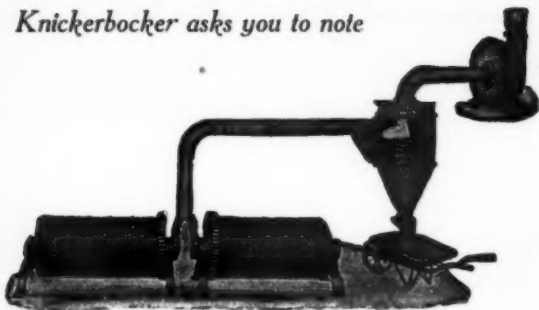
Pipe Benders
Bar Benders
Power Presses
Foot Presses
Etc., Etc.



Get our Catalog of Iron-Workers' Tools for handy reference

George A. Lewthwaite Co.
116 Walker St., - - New York

Knickerbocker asks you to note



Who ---- And How Many "Rarefied" They Use

Solvay Process Co.....	26
Westinghouse Elec. & Mfg. Co., Pittsburgh, Pa.....	21
Western Electric Co., Chicago.....	12
Weston-Mott Co., Flint, Mich.....	12
Willis-Overland Co., Toledo, Ohio.....	10
Oliver Chilled Plow Works, South Bend, Ind.....	9
Pittsburgh Plate Glass Co., Pittsburgh, Pa.....	9
Crane Co., Chicago.....	7
General Electric Co., Schenectady, N. Y.....	7

PERHAPS they first read our Booklet and decided to try one, anyway. The performance of that one was an eye-opener—and they reordered of course.

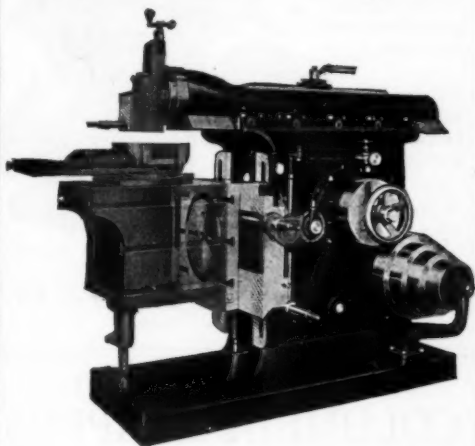
When you realize the exceptional efficiency of the "Rarefied" and the saving in power and repairs it assures you, you will not hesitate to send us your order.



To help you understand the merits of this modern dust collector we would like to send you a copy of that Booklet. Let's have your address

The Knickerbocker Co.
Jackson, Mich.

Milwaukee Shapers



MILWAUKEE Back-Geared
Crank Shapers are built in
16-in., 20-in. and 24-in. sizes.

UNEXCELLED in Rigidity,
Accuracy, Power, Production
and Simplicity.

Milwaukee Shaper Co.

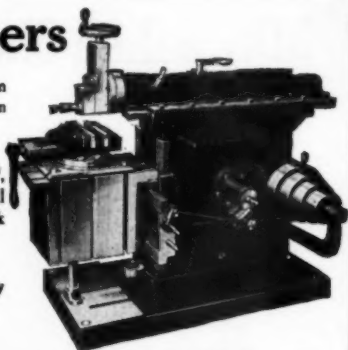
1144-1146-1148 Holton St., 518 Prairie St.,
Milwaukee, Wisconsin

Shapers

The best medium priced Shaper on the market.

Built in 16", 20", and 24" sizes, all back geared crank machines.

A few for early delivery.

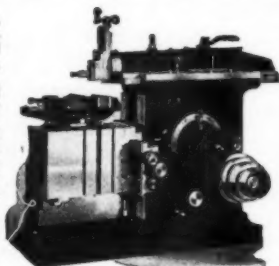


The Osborne & Sexton Mchy. Co.
Columbus, Ohio

HIGH GRADE, HEAVY DUTY COLUMBIA SHAPERS

Ram is girder form, correctly proportioned, extremely rigid. Long and wide bearing in column, which is extra deep. Length of stroke and position of ram easily and quickly changed. Alignment maintained by adjustable wedge gib at side, and clamp gibs at top. Every detail has received special attention.

Send for bulletin No. 4, describing 16", 20", 24" and 28" Columbia Shapers.



The Columbia Machine Tool Company
Hamilton, Ohio

Small in Size--Big in Economy

Rhodes Combined Shaper and Slotter

7½ in. Horizontal } In Combination
3½ in. Vertical } Or Separate

Saves
Time



Saves
Space

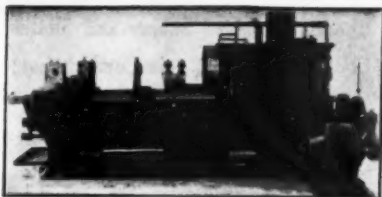
HERE'S AN OPPORTUNITY of saving money in machining your small work, including dies, tools, models, etc. The exceptionally handy Rhodes is of the same convenience as the larger and more expensive machines. Being more compact, it produces bigger results on the foregoing class of work.

The use of better tools is the best, and often the only, way to combat the steadily rising labor costs. The Rhodes' offer you a sure economy. Made in both the floor and bench type.

*Big in economy, big in capacity, but
not in price. Get in touch with us.*

Rhodes Mfg. Company
Hartford, Conn.

MORSE SILENT CHAIN DRIVES



You should know about the remarkable superiority they have shown, from the smallest size to 5,000 h. p. Let us at least figure on their application to your purposes.



Morse Chain Co.
Ithaca, N. Y.

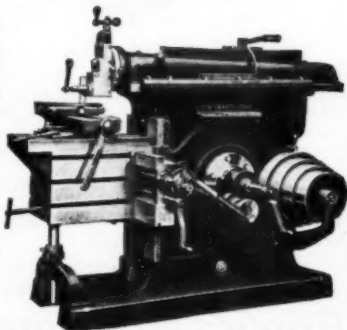
*Morse Engineering Service
Assistance Free*



SHAPERS

12", 14", 16"
Plain Crank,
16", 20", 25"
B. G. Crank,
either Cone
Driven or
through
Speed Box.

28" and 32"
Back Gear-
ed Crank,
Single Pul-
ley Drive.



The Smith & Mills Co. Station B.,
Cincinnati, O., U.S.A.

Barker Wrenchless Chuck Does It All Instantly

HUNDREDS of the best shops in America have increased their production through the BARKER WRENCHLESS CHUCK.

It saves time for them—a great deal of it—to be applied to additional production.

It does all that a chuck should do, and does it *instantly*.

It has many other exclusive advantages of its own.

It is the *modern* lathe chuck.

Sizes 6 to 16 inches. Two and three jaws.

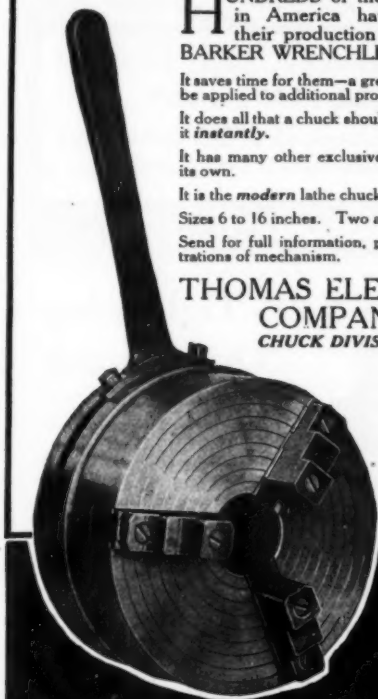
Send for full information, prices and illustrations of mechanism.

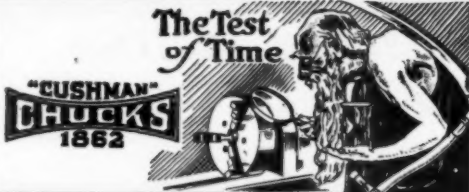
**THOMAS ELEVATOR
COMPANY**
CHUCK DIVISION

31 South Hoyne
Avenue,
CHICAGO, ILL.

328 Park Row
Bldg.
New York
N. Y.

TC-20





LATHE CHUCKS DRILL CHUCKS FACE PLATE JAWS

Three Generations of Skilled Mechanics
have made them and have used them

**THE CUSHMAN CHUCK CO. HARTFORD,
CONN. U.S.A.**

Eclipse Self - Tightening Drill Chuck



Roller bearing.

Quickest and easiest grip, and
it never slips.

Self-tightening. No keys or
wrenches.

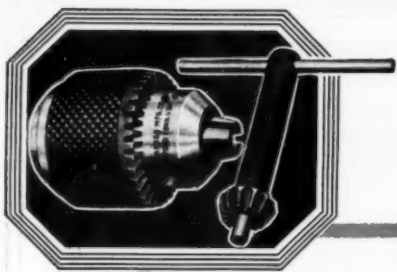
It has no rival in its combination
of quick and firm gripping, easy
release, simplicity and accuracy.

Saves time and money on high
speed drills.

You need it now. Why wait?

**Nielsen-Barton Chuck Co., 106 S. Jefferson St.
CHICAGO, ILL.**

Also makers of ARBORS for all kinds of Chucks
YOUNG, CORLEY & DOLAN, Inc., 115 Broadway, NEW YORK CITY
New York District Agents



On the Job All the Time

Jacobs Improved Drill Chucks are standard equipment in the largest, most representative shops and factories throughout the world.

When other chucks have been retired, Jacobs Improved Drill Chucks have been hired, and have retained their places because of their unfailing, unequalled service where equipment must pay its own way.

The workmen know the value of good chucks. Jacobs Improved Drill Chucks are recommended by them as savers of drills and savers of time.

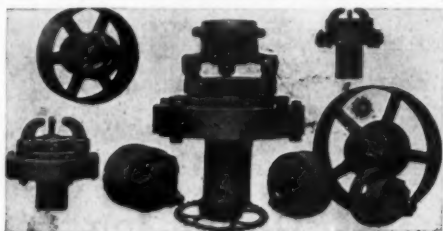
*6 different models
in 12 styles ranging
from 13/64" to 1"*

THE JACOBS MFG. CO.
Dept. H. L.

HARTFORD - CONN.



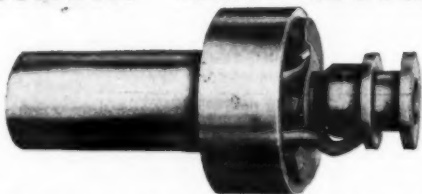
**Refer your clutch problems to us
Solving them is our business**



*Special Clutches — a specialty
Catalogue cheerfully sent on request.*

National Clutch Company
1859 Fulton St., Chicago, Ill.

CONWAY EXPANSION SLEEVE CLUTCH



The sleeve of this enclosed safety clutch is standard, and fits any size pulley—wood, steel or cast iron—sprocket or gear. Used extensively by manufacturers of baking, printing, textile and other special machinery.

Conway "Expansion," "Compression" and "CMT" Clutches cover every clutch requirement. They are the result of over 20 years of intensive application to a single purpose.

Write for Catalog. Expert advice at your service

CONWAY & COMPANY, STOCK YARDS P. O. CINCINNATI, O.

Let The Sweetlands

**Do Their Full Share of Your Saving
Of the Costs of Labor and Material**



Sweetland Lathe Chucks

Reduce labor and power costs to a minimum. They grip work with a remarkable rapidity. The minute adjustments which are possible, permit chucking of uneven rough-cast and forged work without loss of time.

They save material: Chucking with Sweetlands avoids the risk of distortion, fracture, or injury to the work—avoids the unnecessary scrapping of costly material. These chucks are readily adaptable to work of differing shapes and requirements.

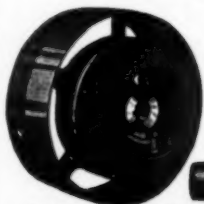
Accuracy to 1000's of an inch is the Sweetland standard for all moving parts.

*Order now and save future worry
Complete description given in catalog No. 11-C*

The Hoggson & Pettis Mfg. Co.
New Haven, Conn., U. S. A.

Edgemont Friction Clutches

The Standard Clutch of Leading Manufacturers



Enclosed Type, Self-Oiling



The value of Edgemonts is not merely a matter of theory but a matter of practice. They have stood up under both use and abuse in long, continuous, heavy and rough service. We will give, upon request, names of many leading machine builders who are enthusiastic users.

These clutches never break, and can be relied upon to pull all that the belt will.

Write for Catalog of "The Clutch that's stood the test"

The Edgemont Machine Co.

Dayton, Ohio

Special Clutches and Transmission Machinery for all purposes.

Carroll Countershaft Clutches

Are guaranteed against repairs



Self-oiling—double adjustment—double gripping power.

We make no pretensions for our clutches that cannot be justified by their record. When you thoroughly understand the essential features of our clutches, we believe you cannot fail to be impressed in their favor. A fair comparison of our clutches with other makes is earnestly desired.

May we have the pleasure of sending full details?

We Furnish Complete Countershafts

L. W. Carroll Manufacturing Co.

Batavia, Ohio

"Reconstruction"

The greatest problem of the American manufacturer today is to so increase his output and reduce his production cost that he is thereby enabled to keep his plant fully at work, regardless of external conditions.



solve this problem wherever rapid machining or reaming is required.

Let us tell you about

McCrosky Wizard Chucks and Collets

for the drill press

McCrosky Turrets

for your old engine lathes

McCrosky Adjustable Reamers

for every reamer operation.

Fully described in Catalog No. 6

"A text book on modern machine-shop methods"

McCrosky Tool Corporation

Meadville, Pennsylvania, U. S. A.

Often Cuts Time In Two

Underwood's Portable Miller is Deservedly
Popular in Railway and General Repair Shops

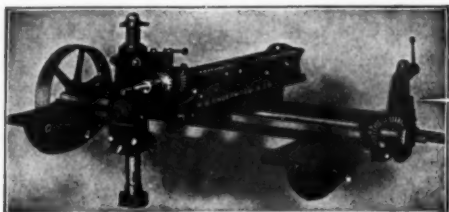


Figure 110

ITS RAPID, accurate, time-saving work satisfies everybody. It enables shops of every size to accomplish a wide range of rush repairs *in place*. The saving is obvious.

Figure 110 has power feed in both directions, and is usable in any position, horizontal, vertical or inclined. It faces a valve seat 22x40x7 in., or does other milling of similar dimensions. Operated by hand, small steam engine, air or electric motor. We can build to suit your special needs. Our line of Portable Tools includes:—

Millers; circular planer tools; radius planers; rotary planers; machines for truing eccentrics, facing domes, arms for facing cylinder flanges; rotary flue cleaners; pipe benders; locomotive cylinder borers; boring bars for lathe work; crank pin turners; reflex water glass grinders; motors, etc.

Let us send you the interesting Catalog

H. B. Underwood Corporation

1015-25 Hamilton St., Philadelphia, Pa.

Second-Hand Machinery.

Lists of Second-Hand Machinery, either for sale or wanted, set in uniform style, will be published under this heading at the rate of **50 cents a line**, across the page, each issue. Minimum charge, **\$4.00**. Sub-headings are counted as one line, but the name and address of advertiser are not included in the space charged for. No display in this department.

Write directly to those offering the machines for sale for prices and full descriptions. If what you require is not listed, use the blank enclosed to make known your wants to the publisher.

WANTED BY

Metal Ware, Care A. H. Hitchcock, 1235 Caxton Bldg., Chicago, Ill.

TOGGLE DRAWING PRESSES.

We are in the market for one each 3½B, 3½C, 3½B, 5S and 14B Bliss Toggle Drawing Presses. What have you to offer? Kindly state in your reply price, age of press and where it may be seen.

FOR SALE BY

Falstrom & Tornqvist Co., - - - Passaic, N. J.

Hoists, ½ ton Yale.....	\$45.00	Shop boxes 18"x24"x8".....	\$ 1.35
Oil tanks, 50 gal., new.....	7.00	Vises, Reed Co., 4½" swivel.....	10.00

Beading and edging machine, new Quickwork-Universal, belt drive.
Rivet spinning machine, No. 103 Grant rotary, for 5-16" rivets, motor driven.
Wire testing machine, Olsen new vertical universal (Plate 481), 20,000 lb. capacity, standard 4-screw type; the strongest, stiffest, most durable type of wire tester made.

The above machines practically new—used but a few months on Government work at Standard Air Craft Corporation.

FOR SALE BY

The O'Brien Machinery Co., 119 N. Third St., Philadelphia, Pa.

Boring and turning lathes, 26"x10' Walter Scott, 2-step cone, d. b. g., 5" belt; some fitted with turret on carriage, six 3" holes in turret; turning lathes swing 5' 4" between centers, 22" over carriage; price low for quick sale; photo and complete specifications on request, (12).

Drill, 22" Cincinnati Bickford, sliding head.

Drill, 25" Buffalo, stationary head, back geared, power feed.

Lathe, 8"x108" Fitchburg Lo-Swing.

Lathes, 26"x12' Bridgeford, heavy duty, (4).

Lathe, 35"x18' Bement.

Milling machine, No. 1 Dow plain.

Miller, No. 1 Garvin universal, vertical attachment.

Pipe machine, 6" Jarecki.

Planer, 24"x24"x6" American.

Planers, 30"x30"x10" Sellers.

Planer, 36"x36"x10" Pond.

Press, No. 5 Stiles, heavy geared.

Punch and shear, single end, capacity 1" in ½", new.

Punch and shear, double end, capacity ½" in ½", new.

Radial drill, 26" Mueller plain.

Shaper, 16" Hollingworth, back geared.

Shapers, 12", 20" and 24" Juengst.

Turret lathes, No. 24 Garvin, wire feed, (2).

Turret lathe, 24" Gisholt horizontal.

Turret lathes, No. 44 Bardons & Oliver, (2).

Turret lathes, No. 5 Bardons & Oliver, (2).

SECOND-HAND MACHINERY

FOR SALE BY

Stocker-Rumely-Wachs Co.,

117-121 N. Jefferson St., Chicago

In stock for immediate delivery.

BORING MILLS.

- 2½" Industrial Works horizontal boring mill.
- 60" Bullard, with two swivel heads.
- 42" Gisholt, like new.
- 76" Bullard, with two swivel heads.

DRILLING MACHINES.

- Rockford bench drill.
- No. 1 Avey single spindle ball bearing.
- 12" Leland Gifford.
- Henry & Wright class B.
- 6' Fosdick radial drill.
- 6' Gang radial drill.
- No. 9 Prentice Bros. radial drill, with 6' arm.

GEAR CUTTERS.

- 30"x 8' Gould & Eberhardt for spur gears.
- No. 3 Farwell gear hobber.

GRINDERS.

- No. 10 Besly disc grinder.
- No. 1 Cincinnati universal tool and cutter grinder.
- No. 6 Modern, internal grinder.
- 6"x32" Norton universal grinder.
- 8"x40" No. 3 Morse plain cylindrical grinder.
- Diamond surface grinder.

LATHES.

- 24"x12' Schumacher & Boye, compound rest.
- 30"x12' Blaisdell, compound rest.
- 32"x18' Bradford, compound rest.
- 37"x18' Fifield, compound rest.

MILLING MACHINES.

- No. 3 Rockford hand miller.
- Van Norman bench miller.
- No. 3 Steptoe miller.
- No. 6 Rockford plain miller.
- No. 2 LeBlond plain miller.
- No. 15 Garvin plain, with vertical spindle attachment.
- Briggs "A" miller.

PUNCHES AND PRESSES.

- No. 54½ Perkins sprue cutter.
- No. 2-P American Can.
- No. 16 Bliss horn press.
- No. 7 Massillon single end punch and shear, 36" throat arch. jaws, capacity 1½" thru 1", new.

SCREW MACHINES.

- 14" Warner & Swasey plain head turret lathe.
- No. 4 Warner & Swasey universal, s. c. and wire feed.
- No. 6 Warner & Swasey, geared friction head, automatic chuck and wire feed, power feed to turret slide.
- No. 6 Foster, friction, automatic chuck and wire feed, power feed to turret.
- No. 9 Bardons & Oliver geared friction head, automatic chuck and wire feed, power feed to turret and cut-off slides.

MISCELLANEOUS.

- Shaper, 16" Baker, vertical.
- Slotter, 18" Canadian Machinery Corporation, good as new.
- Tapping machine, No. 2 Garvin.

SECOND-HAND MACHINERY

FOR SALE BY

Niles-Bement-Pond Company, 111 Broadway, New York
 Located at our various factories and stores.

LATHES.

12"x 8' Robbins, draw-in attach.	18"x 8' LeBlond, quick change.
14"x 6' Bradford, c. r.	18"x 10' Fiather, c. r.
14"x 6' Whitcomb, taper, pan.	21"x 8' LeBlond, geared head, heavy duty.
14"x 8' Whitcomb, q. c.	21"x 8' Bradford, c. r.
15"x 7' P. & W. speed lathe.	21"x 10' Bradford, c. r.
16"x 6' Whitcomb, q. c.	22"x 8' Niles, c. r.
16"x 8' Reed, r. & f. rest.	24"x 10' Whitcomb, q. c.
16"x 8' Bradford, c. r.	30"x 14' Niles, c. r.
16"x 8' Von Wyck, quick change.	30"x 16' Pond, quick change.
18"x 6' Prentice.	

TURRET LATHES.

No. 6A P. J. automatic motor drive.	24" size I Gisholt, 220 volt, motor drive, d. c.
2"x 24" J. & L. cone head.	25" Milwaukee rigid.
2"x 24" Warner & Swasey, hol. hex.	34" size K Gisholt, 4 1/2" spindle.
2"x 26" P. & W. turret lathe.	
28" size J. Gisholt, 3 1/2" spindle.	

SHAPERS AND PLANERS.

15" P. & J. univ. shaper.	30"x 30"x 12' Pond, 2 heads, 220 v., d. c., reversing motor drive.
16" Stockbridge shaper, p. d. f.	30"x 30"x 10' Pond, 2 heads.
14"x 6' Niles sgl. trav. head shaper.	32"x 32"x 6' Gray, 2 heads.
22"x 22"x 8' Cincinnati.	48"x 48"x 16' Pond, 3 heads.
24"x 24"x 6' heavy Cincinnati.	72"x 60"x 10' Pond, 2 heads.
26"x 26"x 6' Pond, 2 heads.	72"x 72"x 24' Pond, hvy. forge, 3 hds.
30"x 30"x 6' Pond, 2 heads.	
30"x 30"x 8' Pond, 2 heads.	

MILLERS AND GEAR CUTTERS.

No. 1 Cincinnati plain, cone type.	No. 5 Brown & S. vert., old style.
No. 2 Becker B. plain.	No. 3 36"x 8' B. & S. gear cutter.
No. 2 Cincinnati plain, cone type.	No. 4 36"x 9' B. & S. gear cutter.
No. 3 Brown & S. univ., old style.	No. 6 60"x 12' B. & S. gear cutter.
No. 2 LeBlond plain, single pulley.	15" Gleason bevel gear generator.
No. 5 Becker B. vertical.	24" Gleason bevel gear planer.
No. 2 Brown & Sharpe vertical.	

DRILLING MACHINES.

No. 1 Putnam, gooseneck.	5' Niles semi-universal, old style.
26" B. F. Barnes, sliding head.	6' Niles semi-universal, old style.
32" Aurora, sliding head.	6' Pond heavy plain radial, 220 v., motor drive, d. c.
60" Niles, heavy vertical.	2 spindle Allen 12" o. h.
3' Grant radial drill and boring mch.	3 spindle Allen 12" o. h.
4' Prentice speed box radial.	
4' Niles semi-universal, old style.	

GRINDERS.

No. 11 Brown & Sharpe internal.	8"x 48" No. 14 plain Landis.
No. 3 B. & S. cutter and reamer.	12"x 44" No. 14 plain Modern.
4"x 30" No. 11 Brown & Sharpe pl.	12"x 66" No. 4 Landis universal.
10"x 30" universal Landis.	39" grindstone frame, B. & S.

BORING MACHINES

No. 1 Barnes horizontal drill.	No. 3 Bement horz. 4 1/2" spdl. 3' tbl.
No. 1 Bement horz. 2 1/2" spdl. 5' tbl.	30" Niles turret borer.
No. 2 Bement horz. 3 1/2" spdl. 6' tbl.	42" Niles boring and turning mill.

MISCELLANEOUS.

Air compressor, type 10, Ingersoll-Rand, steam driven, capacity 535'.
 Air compressor, Ingersoll-Rand duplex, motor driven, with 35 h. p., d. c. motor, capacity 215'.
 Blower, No. 10 Sturtevant.
 Blower, No. 70 Buffalo.
 Blue print mch., Wagenhorst, 60", vertical cylinder.
 Engine, 164 h. p. McEwen, direct connected to 100 k. w. generator, d. c. 220 v.
 Engine, 300 h. p. Brown, belted to 200 k. w. Westinghouse generator, d. c. 220 v.
 Profiler No. 3 automatic, Keller.
 Saw, 8" rounds, Higley.
 Slotter, 6" Bement.

SECOND-HAND MACHINERY

FOR SALE BY

Harris Brothers Company,

35th & Iron Sts., Chicago, Ill.

ENGINE LATHES.

Screw-cutting quick change mechanism, 3-step cone, dbl. bk. grd., comp. rests: 18"x 6' Ryerson, (4). | 20"x 10' Canada Machy. Corp., (5).

With turrets on carriage with compound rests:

18"x 6' Canada Machy. Corp., (2). | 20"x 8' McDougall, (3).

With loose change gears, 3-step cones, dbl. back grd., and compound rests:

18"x 8' Sidney, (3). | 18"x 8' Milwaukee, (6).

With loose change gears, compound rests, single back geared:

15"x 8' Williams. | 18"x 8' P. P. Silk, (3).

18"x 6' Cincinnati. | 21"x 7' Bertram.

18"x 8' Barker, (4). | 10" Wells speed lathes, (10).

18"x 6' Giddings & Lewis, (4).

Plain turning lathes with plain rests. (Not screw cutting):

16"x 6' Rockford, pan bed, (10). | 20"x 8' Simplex, (4).

With turret on carriage but without plain rest:

18"x 8' Milwaukee, (10).

All the above lathes have hollow spindles and countershafts.

DRILL PRESSES.

Colburn 25" swing, heavy duty, high speed, No. 5 Morse taper, single pulley drive, (9).

Barr 2-spindle 14" sensitive, cap. $\frac{1}{2}$ ". Brown & Sharpe 36" vertical boring mill, with tur. hd. and chuck jaws.

GRINDERS.

Wells Bros. cutter and reamer.

Ford Smith cylindrical grinders, (2).

$\frac{1}{2}$ h. p. Electric grinders, (5).

12x60" Brown & Sharpe No. 4 universal cylindrical grinder.

TURRET LATHES.

Jones & L. 3"x36" bar outfit, (3).

Warner & Swasey No. 4, 16" swing.

W. P. Davis 24" swing set over turret, all power feeds, (2).

MILLING MACHINES.

Rockford No. 1 $\frac{1}{2}$ plain table, 38"x9".

Ford-Smith No. 2 plain table, 46"x10".

No. 6, 48" swing vertical Becker, latest type, improved standard miller, all power feeds, longitudinal 62"; transverse 20"; vertical 20"; power down feed to spindle head, 12" power feed to rotary.

HACK SAWS.

Racine high speed, 6" capacity.

Peerless high speed, 6"x6".

PUNCH PRESSES.

Williams straight sided, b. grd., sgl. action punch press, 22" between uprights.

HAMMERS.

Board lift drop hammers, 1000 lb., (2).

Board lift drop hammers, 2000 lb., (2).

6,000 lb. Chambersburg steam hammer, brand new.

PUNCHES AND SHEARS.

Long & Allstatter combination shear and beveling mche., wt. about 25,000 lb.

Alligator shear for 14".

Wiener steel plate "I" beam shear for 15" "I" beam.

Thompson bevel cutting shear, $\frac{1}{2}$ " plate.

Hilles & Jones sgl. end punch, 8" throat, architectural jaw, cap. $\frac{1}{4}$ " thru $\frac{3}{8}$ ".

TRAVELING CRANE.

Niles electric traveling crane, 46' span, 15 ton cap., with auxiliary hoist, 5 ton, 4 motor type, 220 d. c.

1000 lbs. of Stellite and Red Cut High Speed Steel.

Our complete Machinery Bulletin sent upon request.

SECOND-HAND MACHINERY

FOR SALE BY

McCoy-Brandt Machinery Company

Office and Warehouse, 210-218 Penn Ave., Pittsburgh, Pa.

BOLT CUTTERS.

4" Acme, double-head, with motor. Nut tapper, 2-spd. Acme, 1 1/2", pan.
1 1/2" Acme, dbie.-hd., oil pump, pan.

DRILLING MACHINES.

8-spindle gang, Foote-Burt. 24" Barnes, plain, sliding head.
4-sp gang, Bickford, cap. 2" holes. 24" Cincinnati, pwr. fd., sliding hd.
20" Baker heavy duty, power feed. 28" back geared, power feed, spindle
24" Colburn hvy. duty, No. 4 Morse. 1-3/16" hole.

LATHES-TURRET.

3x26" J. & L., chucking equipment. 3x36" J. & L., bar equipment.
2 1/2" Garvin, 6-hole hexagon turret, B. & S. 1 1/2" h.s., 7-hole round turret,
12" box chuck. 9" box chuck.

GRINDERS.

126" Bridgeport, cupwheel, knife. Bath univ. tool & cutter, 14x40".
B. & S. plain, 12x12", auto. feed. No. 13 B. & S. univ. & tool, auto. fd.

MILLING MACHINES.

No. 1 B. & S. plain, hand feed. No. 3 Cincinnati plain, q. c. g.
No. 3 B. & S. universal, 12" index No. 2 Cleveland, universal.
head, table 10x50".

LATHES.

72"x31' 6" Fifeild, triple geared. 17"x8' Sidney, q. c. g., d. b. g., c. r.
40" Niles car wheel turning, journal 16"x 6' Prentice, h. s., c. r., 12" 4-
attachment, m. d. jaw chuck.
24"x15' Fifeild, solid spdl., pln. rest. 16"x 6' R. M. & C., h. s., c. r., 12"
24"x12' S. B. & E., 5" raising blocks, 4-jaw chuck.
h. s., c. r., 18" 4-jaw chuck. 16"x 6' LeBlond, h. s., c. r., 12" 4-
24"x10' LeBlond, q. c. g. jaw chuck.
20"x10' LeBlond, q. c. g. 14"x6' Hendey, geared hd., q. c. g., c. r.
20"x 8' LeBlond, q. c. g., t. a. Speed lathes, 17", 15", 13"—4' bed.
16"x 8' American, geared head, t. a.

MOTORS AND GENERATORS.

30 & 20 h. p., 3-60-220 v. 7 1/2 h. p. Triumph, 220 v., d. c., elev. duty
10 h. p. Fairbanks, 2-60-440 v. 15 h. p. G. E., 500 v., d. c.
1 h. p., 2-60-220 v., 1800 rev. 90 k. v. a. Lincoln, 3-60-220 v.
10 & 4 1/2 h. p., series wd., 220 v., d. c.

PRESSES AND BRAKES.

Perkins punch, 2" stroke, 4,500 lbs. 13' 6" Garrison brake or press, cap.
Consolidated, geared, 4" stroke. 1/2", weight 118,000 lbs.
8' Robinson toggle press.

PUMPS.

3 1/2"x24" Deane deep well, 25 g. p. m. 3 1/2"x10" Deane triplex, belted.
for motor drive. 7x5x10" Hall, duplex, steam.

PUNCHES, SHEARS AND ROLLS.

14" throat L. & A., cap. 2 1/2"x1 1/2". Guillotine shear, No. 3 Cleveland,
48" throat Reade, cap. 1 1/2" thru 1 1/2". 3 1/2" stroke, capacity 2" sq.
36" throat Whiting, cap. 1" thru 1". Guillotine shear, No. 5 Cleveland,
36" thrt. Cleveland, cap. 3/4" thru 3/4". 3" stroke, capacity 2 1/2" sq.
15" throat, double, capacity 1 1/2"x1". Guillotine shear, Cleveland, 3" stroke,
Williams-White No. 13. capacity, 2" square.
14" throat, double, capacity 2 1/2"x1 1/2". Slitting shear, rotary, 23" throat,
No. 11 Williams-White. capacity 1 1/2", Newbold.
50" thrt., sgl., cap. 1 1/2"x1" Cincinnati. Squaring shear, 26" pwr., cap. 16 ga.
Guillotine shear, No. 3 Wilder, cap. 1, 1 1/2" stroke. Squaring sh., 122" Bertsch, cap. 3-16".
Bevel shear, Thompson, rated cap. 3". Rolls, 10' Bertsch, cap. 14" gauge.

SHAPERS AND PLANERS.

20" Steptoe, crank. 30"x30"x10" Sellers, 1 head.
24" Cincinnati, crank, b. g., vise. 24"x24"x6" American, 1 head.

STEAM HAMMERS.

1000 lb. N.-B.-P. dbie. frame, (4). 700 lb. Pittsburgh, dbie. frame, (3).
700 lb. N.-B.-P. dbie. frame, (6). 600 lb. Morgan, double frame, (7).

MISCELLANEOUS.

Boring mill, Sellers horiz., 2 1/2" bar. Pipe machine, 8" E. C. & B., dies.
Compressors, 9x5x10" Westinghouse. Pipe mche., 4" Williams, m. d.

SECOND-HAND MACHINERY

FOR SALE BY

Badger-Packard Mch. Co., 133-139 W. Water St., Milwaukee, Wis.

LATHES.

11"x4' Seneca Falls speed lathe t. & l. pulley, c. s.
16"x 7' Loose change gear, 4-step cone, s. b. g. engine lathe, with c. s.
20"x10' Putnam, loose change gear, 4-step cone, s. b. g. engine lathe, with c. s.

MISCELLANEOUS.

Drills, No. 2 Detroit 5-sp. semi-auto.
horiz., with c. s.; no chucks or fixtures, (2).

Exhauster, planing mill, No. 40
Sturtevant, slow speed.

Feed water heater, 22"x69" Allis-
Chalmers, Reynolds closed pat.

Gear cutter, Whiton.

Glue heater, steam 100 gal. Advance,
Wetmore.

Grinder, No. 6 Bealy disc, double
spdl., belt dr., with c. s.

Grinder, 72" Holmes auto. knife.

Grinder, 10"x20" Landis universal
with equipment.

Grinder, Sterling univ. tool and
reamer, complete univ. equipment,
95% new.

Grinder, Cleveland profile, with mo-
tor for a. c. or d. c.; used 30 days.

Miller, No. 10 Kempsmith, hand.

Miller, No. 1 Fox, hand, power feed,
95% new.

Oven furnace, No. 1 Stewart, with
blower.

Pipe machine, 4" Armstrong, hand
and power.

Planer, 24"x24"x16" Fitchburg.

Planer, 30"x30"x 8' Steptoe-McFar-
lane, single head, with c. s.

Purifier, 30"x6" Buffalo, closed pat'n.

Rivet spinning machine, Grant, 110
v., d. c., motor driven, 3/16" cap.

Screw mch., 1 1/2"x17" Hartford auto.
Steam pump, 5"x2 1/2"x6" Bard duplex.

FOR SALE BY

A. D. White Machinery Co., - 108-114 N. Jefferson St., Chicago

ENGINE LATHES.

16"x12' Beaman & Smith, taper.

20"x 8' Boye-Emmes, d. b. g., q. c.

22"x10' Davis, d. b. g., q. c.

MILLING MACHINES AND PLANERS.

No. 1 Brown & Sharpe plain.

No. 5-B Becker vertical, (2).

No. 6 Brainard, Lincoln.

PUNCH PRESSES AND PUNCHES AND SHEARS.

No. 30 Crosby open back press.

Waterbury reducing press, 7 1/2" str.

No. 29 Bliss, gang, double action.

DRILL PRESSES.

23 1/2"-4 spindle Barnes gang.

28" Bickford, sliding head.

42" Barnes, sliding head.

42" Miles radial, plain.

2 spindle Foote-Burt sensitive.

SCREW MACHINES.

7-16" Cleveland, friction feed.

1" Cleveland, friction feed.

1 1/2" Cleveland, friction feed.

1 1/2" Cleveland, jigger feed.

1" Hartford, (2)

24"x10' Putnam.

26"x25" Blaisdell.

New lathes 13" to 18".

16"x16"x36" Draper planer.

30"x27"x 6' Putnam planer.

No. 1 Burke bench millers, (4).

No. 6 L. & A., 4" thr., cap. 1/2" s. c.

Rock River d. c. 24" thrs., cap. 1/2".

No. 37 Williams & W. gang punch.

3 spindle Foote-Burt sensitive.

3 spindle American sensitive.

3 spindle Dwight Slate sensitive.

4 spindle Dwight Slate sensitive.

MISCELLANEOUS.

Bolt cutter, 1 1/2" double hd., Adams.

Blower, No. 7 Sturtevant high
pressure.

Gas engine, 35 h. p. Columbus.

Gas engine, 55 h. p. Bruce McBeth.

Grinder, No. 38 Safety. Plow.

Grinder, No. 3 Brown & Sharpe sur-
face, 36x14x11 1/2.

Grinder, Springfield, 2-wheel water.

Grinder, Leland & F., water.

Hammer, 500-lb. Sandage.

Oil gas generator, No. 3 American.

Rivet spinner, Grant, 5/16".

Saw, No. 5 1/2 Nutter-Barnes.

Tapper, No. 1 Garvin automatic.

Tube cutter, No. 3 Fox.

Turret lathe, No. 3 Foster, plain.

Turret lathe, 24"x26" Greenlee.

Turret lathe, 20" Fay & Scott.

Turret lathe, 3x36 Jones & Lamson.

SECOND-HAND MACHINERY

FOR SALE BY

Russell Machine Company, 28th St. & A. V. R. R., Pittsburgh, Pa.

LATHES.

48"x16" bed lathe, compound rest.
 48" Niles car wheel, m. d.
 38"x25" New Haven, raised to 56".
 38"x18" Pond, triple geared.
 30"x14" Marshall & Huschart, hollow spindle, compound rest.
 27"x12" Pittsburgh, dbl. b. g.
 26"x16" Draper, triple geared.
 26"x10" Walcott, q. c. g.
 24"x16" 6" Johnson lathe.
 24"x12" Dietz, Schumacher & Boye.
 20"x12" Prentice, h. s., c. r.

PLANERS AND SHAPERS.

24"x24"x 8' Chandler planer, 1 head.
 27"x27"x8' planer, 1 head.
 30"x30"x9' Sellers, 1 head.
 38"x36"x12' Pond, three heads.

DRILLS AND BORING MILLS.

Burke sensitive bench Nos. 0 & 1.
 14" Rockford sensitive drill.
 10" Barnes sensitive drill.
 No. 3 Prentice port. rope drive drills.
 20" Silver, new, plain and bk. gd.
 20" Foote-Burt mfrs. vertical.
 20" Barnes plain drill.
 24" New Haven plain drill.
 26" Prentice, b. g., sliding head.

HAMMERS AND MILLERS.

1500 lb. double leg steam drop.
 1500 lb. single leg steam forging.
 Bradley cushion helves, 40 lb.

ENGINES AND BOILERS.

50 k. w. American steam elect. unit.
 4 h. p. Fowler vertical gas engine.
 40 h. p. Backus horiz. gas engine.

PUNCHES, SHEARS, PRESSES AND ROLLS.

50" throat Reade sgl. end punch and shear; massive construction.
 18" throat Rees s. e. punch.
 18" throat Rees s. e. shear.
 No. 8 L. & A. geared s. e. punch.
 31" throat, punching cap. 1"x1".
 45"x1" Wais & Roos sq. shear.
 Bliss geared slitting shear, 18" thr.

MISCELLANEOUS.

Air compressor, No. 0 Au-To 3"x4".
 Air compressor, s. cyl. 3x5", belted.
 Air compressor, double cyl. 2"x4".
 Air compressor, 6x6 Laidlaw hor.
 Bender, Wallace No. 11 angle, hd. pr.
 Bender, Hinman No. 1 Eye, hd. pr.
 Blower, Root No. 3 Acme, hand.
 Blower, pressure, No. 3 Sturtevant.
 Blower, Buffalo No. 10, pressure.
 Bolt cutter, 2" Acme, single head.
 Brazing table, all iron, 17"x29"x31".
 Centering mch., Whiton 6" sgl. spdl.
 Chain belt, 16"x8"x1 1/2" p. and gear.
 Cold saw, Newton, 20" dia., 5 1/2" rd.
 Crane, 10" I-beam, 12'3" span, with Harrington 6,000 lb. chain hoist.
 Cutting-off mch., Hurlburt R. 4".
 Grinder, Western No. 10.

20"x10" Mueller, h. s., c. r.
 20"x8" 6" Walcott, q. c. g., (3).
 19"x10" LeBlond, motor drive.
 19"x 8" LeBlond, q. c. g., heavy duty.
 18"x 8" Mueller, q. c. g., heavy duty.
 16"x 6" Blaisdell, h. s.
 15"x 6" Von Wyck, compound rest.
 9"x40" Barnes, foot power.
 14"x 8" American speed lathe.
 24"x11" American semi-auto. turret.
 14"x 5" Fox brass lathe.
 Speed lathes, various sizes, (10).

72"x56"x12" Betts planer, 2 heads.
 16" Hendey friction shaper.
 20" Cincinnati b. g. crank shaper.
 32" G. & E. b. g. crank shaper.

38" & 40" New Haven drills.
 48" Bickford radial, box table.
 Beaman-Smith hor. boring, drilling & milling mch., 4" bar, 36" travel.
 Garvin 4 spindle drill press.
 48" Niles car wheel boring mill.
 42" Colburn vertical boring mill.
 60 & 76" Bullard vertical bor'g mills.
 72" Niles & Pond vert. bor'g mills.

Little Giant 50 lb. power hammer.
 No. 0 Owen plain miller.
 No. 2 Brown & Sharpe univ. miller.

50 h. p. White-Middleton gas engine.
 50 h. p. vert. submerged tub. boiler.
 6 h. p. vertical single flue boiler, (4).

Perkins No. 2 rotary shear, 12" thr.
 No. 3-A R. & K. inc. presses, 2 1/2" str.
 No. 56 dbl. housing knuckle press.
 No. DG-76 Ferracute single acting.
 Straight-side punch press, 4" str.
 No. 4 Stevenson foot pwr., 6" thr.
 60"x3" hand power rolls.
 Toledo No. 365 gap rolling mill.

Grinder, 10" dbl. e. emery, on column.
 Grinder, Russell 12" dbl. end bench.
 Grinder, No. 2 Woods universal tool & cutter.
 Grinder, Barnes 20" wet tool.
 Grinder, 20" Ransom w. t., 250 v., d. c.
 Grinder, Cincinnati tool and cutter.
 Grinders, Landis 26x96; Cinti t. & c.
 Grinder, twist drill, cap. to 2 1/2".
 Hack saw, Sterling, cap. 5"x5".
 Metal lockers, 10 sections.
 Motors, various types, 2 to 40 h. p.
 Polishing stand, Diamond No. 2.
 Polishing stand, d. end, 42"x1" arbor.
 Polishing stand, Cuyahoga dbl. end.
 Slotter, 24" Dill, new.
 Tapping machine, No. 2 Garvin.
 Vises, Forges, Pumps, Tanks.

SECOND-HAND MACHINERY

FOR SALE BY

Wm. C. Johnson & Sons Machinery Co.,
1001-3-5 N. Sixth St., St. Louis, Mo.

LATHES.

17"x 6' Oliver quick change.	21"x10' LeBlond, q. c., heavy duty.
18"x 8' Rockford, quick change.	26"x10' Bridgeford quick change.
20"x 3' Lodge & Shipley all g. h.	28"x16' Long & Davis.

PLANERS.

26"x26" x5' Pease.	30"x30"x8' Hewes & Phillips.
30"x30"x6' Putnam.	36"x36"x8' Gray.

DRILLING MACHINES.

36" Baker Bros.	42" Dreeses heavy duty.
40" Bement gooseneck drill.	

MILLING MACHINES.

No. 3½ Fox.	No. 3 LeBlond plain, with dividing head.
No. 3 Owen, with dividing head.	

GRINDERS.

12"x24" Modern plain.	14"x36" Landis universal.
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MISCELLANEOUS

Blower, No. 3 Root.	Press, inclinable, No. 6 Niagara.
Bolt header, 1½" Blakeslee.	Press, arch, No. 40 Swaine.
Brake, 8' steel, No. 18 capacity.	Punch & sh. No. 1 L. & A., 24" tht.
Brake, 10' steel, No. 16 capacity.	Screw machine, P. & W., hand, 2".
Bulldozer, No. 3 Fisher.	Screw machines, Warner & Swasey, hand, 2".
Gear cutter, 26" Cincinnati.	Shear, alligator, No. 2 Doelger & Kirsten.
Grinder, No. 38 plowshare.	Turret lathe, 3x36 Jones & Lamson.
Hammer, steam, 1100 lb.	
Numbering machine, Noble & W.	

FOR SALE BY

Frank Toomey, Inc., 127-131 N. Third St., Philadelphia, Pa.

LATHES.

13"x 7' 6" new Carroll-Jamieson, plain change.
 14"x 6' Neat, double back geared.
 14"x 6' new Carroll-Jamieson, quick change.
 15"x 6' new Sidney, quick change, swings 17".
 16"x24" new Kahn-Larmon, double back geared, quick change.
 17"x 8' new Sidney, quick change, swings 19".
 19"x 8' new Sidney, quick change, swings 21".
 25"x14" new Sidney, quick change, swings 27".
 33"x12' Putnam.

TURRET LATHES.

24" Davis chucking.	No. 1 Bardons & Oliver, screw.
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VERTICAL BORING MILLS.

60" Bullard, two heads.	64" Niles, two heads.
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PLANERS.

48"x48"x12' Hamilton, 2 heads, motor drive.	31"x23"x68" Smith, one head.
36"x36"x 8" Gray, two heads.	18"x 8"x 3' Wheeler, one head.

SHAPERS.

16" new Steptoe, b. g.	24" new Steptoe, b. g.
20" new Steptoe, b. g.	16" Barker, traveling head.

MILLING MACHINES.

No. 4 Brown & Sharpe, plain.	No. 0 Steptoe, hand, new.
No. 1½ new American, plain.	No. 1 United States, new, hand.

GRINDERS.

No. 1 Landis internal.	No. 1 Grand Rapids new cutter and reamer.
No. 1 Fraser universal, new.	

DRILLING MACHINES.

60" Bickford radial.	32" new Superior, sliding head.
48" Fosdick radial.	28" new Superior, sliding head.
36" new Superior, sliding head.	25" new Superior, sliding head.

SECOND-HAND MACHINERY

FOR SALE BY

Cyril J. Bath & Co.,

721 St. Clair Ave., N. E., Cleveland, O.

Selections from Stock.

AUTOMATICS.

2½" and 4½" Model A Cleveland, in very good condition, with large equipment. No. 33 New Britain auto. chucking mchs., 5 stations & tapping spd., handle work up to 2½" diam. in chuck jaws & 5½" swing outside chucks; very good, (3).

BAR STOCK MACHINES.

No. 4 Warner & Swasey screw machines, power feed to turret, good, (2).

No. 6 Warner & Swasey screw machines, power feed to turret, good, (2).

2" and 3" P. & W. screw machines, good.

No. 2 Bardons & Oliver screw mche. with 13 collets, dbl. friction c. s. good.

BORING MILLS.

24" Bullard vertical turret lathe, side head, fine condition.

30" Gisholt, single pulley drive, rapid traverse, 3-jaw chuck, good as new.

42" Niles vertical, one swivel, one turret head, 3-jaw table, fine condition.

BULLDOZER.

No. 5 Ajax hi-speed, with steel bed and cut gears; first class condition.

DRILLING MACHINES.

20", 22½", 24" and 28" Sibley, new. Also one 20" Sibley, second hand.

2-spindle 24" Barnes all geared drill, pump and piping; fine shape, one spindle with tapping attachment.

Sibley & Ware drill presses, (3). One 22" Rockford drill press.

Large Colburn D-3 hi-speed drills; very good condition, (2).

GEAR CUTTER.

No. 3-26" Brown & Sharpe plain, with all parts, very good condition.

GRINDERS.

Cincinnati No. 1 old style cutter grinder, complete, good shape.

No. 2 Woods tool and cutter grinders; good as new, (2).

Wet and dry Yankee drill grinders.

18" Bryant internal grinder, late model, excellent condition.

No. 60 Heald cylinder grinders, first class, (2).

LATHES.

18"x 8' Mueller engine lathes, q. c. g., dbl. bk. grd.; very good condition, (2).

20"x 8' Walcott engine lathes, quick change gear, countershaft, etc., (2).

24"x 11' Johnson compound rest engine lathe, very good condition, complete with standard equipment.

MILLING MACHINES.

Billings & Spencer die trimming improved miller; first class condition.

No. 60 Brown & Sharpe plain hand miller.

No. 25 Becker plain horizontal miller; almost new.

No. 3-B heavy Brown & Sharpe hi-power; fine shape.

No. 4 Brown & Sharpe cone type with dividing hds., vert. att., etc., very good.

AB1 Becker hi-power vertical, fully equipped with oil pump and countershaft.

PLANERS.

22"x 22"x 5' J. S. Wheeler, with one belt on each side, quick return to table, in first-class operating condition.

36"x 36"x 14' Pond single head, in good condition, table 6" thick, no broken T slots or pegged gears, a good rugged tool, fine condition.

PRESSES.

No. 59 Toledo tie rod frame; first class condition.

No. 78½ Bliss straight side tie rod frame press, stroke 10", distance bed to slide stroke down adj. up 20"; practically as good as new.

No. 77½ Bliss straight side tie rod frame presses, 18 stroke, (2).

Dries & Krump power brake 10'-1" long, 3/16" capacity, belt drive; nearly new

SAWS.

11½" Higley bolt cut-off saw, 14" blade; in good operating condition.

Metal band saws, (2).

Peerless hi-speed 6" saws; new, (3).

MISCELLANEOUS

Hammer, 100 lbs. Mayer, belt drive, regular equipment; new.

Keyseater, No. 0 Baker, with 10" stroke; in good condition throughout.

Return roller, No. 0 Ajax very good.

Shaper, 24" Juengst horizontal crank shaper, worm gear dr.; good condition.

Speed lathe, small, 10"x 5'; good.

SECOND-HAND MACHINERY

FOR SALE BY

H. D. Warner,

57 May St., Hartford, Conn.

Annealing furnace, automatic rotary.
Automatic, 14" mult-spindle. Gridley.
Automatics, 24" mult-spindle. Gridley, (3).
Automatic, 14" Cleveland.
Automatics, 24" Cleveland, (2).
Automatics, 6" Cleveland, (2).
Automatics, No. 23 New Britain, (6).
Broaching mchs., No. 1 Lapointe, (5).
Chuckling mchs., No. 33 New Britain.
Drill presses, 3-spindle Allen, (6).
Drill presses, 4-spindle Allen, (6).
Drill presses, 5-spindle Allen, (4).
Drill presses, 6-spindle Allen, (2).
Drill press, 4-spindle Norton & Jones.
Drill press, 4-spindle Barnes.
Grinder, No. 2 Landis universal.
Header, 1" Acme hot bolt.
Lathe, 2" x 24" J. & L., sliding head.
Lathes, new 1918, 3" x 36" J. & L., (10).
Lathes, 20" x 16" Reed-Prentice, (5).
Millers, P. & W. Lincoln, (6).

Millers, Briggs type A, (24).
Milling machines, 10" P. & W. automatic, (12).
Milling machines, 12" P. & W. light automatic, (40).
Press, No. 55 Toledo, 1" stroke.
Press, No. 58 Toledo.
Presses, Bliss No. 69-N, (2).
Presses, Bliss No. 734, (3).
Presses, Bliss No. 734, (2).
Presses, Bliss No. 744, (2).
Presses, Bliss No. 19, (6).
Profilers, P. & W. 2-spindle, (4).
Screw machine, No. 3 P. & W., hand.
Shear, alligator, to cut 14" square cold steel.
Spot welder, Toledo, 1" capacity.
Tote boxes, steel, 15x10x5", (10,000); price \$1.05 each in lots of 100 or more.

FOR SALE BY

The Strong, Carlisle & Hammond Co., Cleveland, O., Detroit, Mich.

ENGINE LATHES.

14"x 6' Flather, c. r., standard pat.
16"x 6' Bradford, c. r., 5-step cone, standard pattern.
17"x 7' Fulton, c. r., g. f. h. plain turning lathe.

16"x 6' Reed, c. r., standard pattern.
18"x10' LeBlond, c. r. & t. a., 5-step cone, (2).
18"x10' Springfield, c. r., 5-step cone. Old style stud lathe.

TURRET LATHES AND

SCREW MACHINES.

14" Lodge & Davis, plain head.
14" Lodge & Davis, b. g.
24" Davis turret boring and chucking lathe, with forming rest.
No. 4 Warner & Swasey g. f. h. turret screw machines, (2).
No. 4 Warner & Swasey screw mchs., with auto. chuck and wire feed.

18" Acme screw mchs., p. f. to tur., (4).
24" Lodge & Shipley g. f. h. turret lathe, 2-step cone, 6" belt, p. f. to turret, with air chuck.
14" A Cleveland automatic.
No. 00 Brown & Sharpe automatic.
2" Hartford full automatic.

MILLING MACHINES.

No. 21 Garvin, plain, b. g.

No. 2 Bristol, hand, p. f. to table.

GRINDERS.

No. 10 Cochrane-Bly auto. bench saw filing machine.
Whitney wet tool.
Greenfield univ. cutter and reamer.
B Standard Diamond grinders, (2).

No. 1 Warner & Swasey, cock.
Type "DE" Hisey-Wolf internal.
6" Blount emery stand.
Rivett ball race grinder, with countershaft.

HAMMERS.

Coffman, post, power dr., 25 lbs., c. s.
100 lb. Cady, belt drop, c. s.
100 lb. Bradley upright helve, (2).

30 lb. Bradley upright helve.
200 lb. Bradley upright helve, (3).

RIVETERS.

11 1/2" throat Giant rivet spinner.

No. 203 Giant rivet spinner.

PUNCH PRESSES.

No. 11 Badger, hand.

MISCELLANEOUS.

Cold saws, 12" Burke, (3).
Cold saw, Higley.
Drill, 5 spindle Detroit semi-auto.
Filing machine, Simplex.
Gear cutter, No. 2 Whiton auto.
Hack saw, Excelsior, power.
Hack saws, Victor, power, (3).

Polishing stands, heavy, (3).
Polishing lathes, City Machine Co., double end, (8).
Polishing head.
Tapper, 1/2" Burke, bench.
Tapper, 1/2" friction vertical bench.
Tapper, Garvin No. 2, sgl. spindle.

SECOND-HAND MACHINERY

FOR SALE BY

Brown-McDonald Machinery Co., 2323 N. 9th St., St. Louis, Mo.

BORING MILLS.

48" Bullard, vert., 1 plain & 1 swivel hd. on cross rail, face plate jaws, used.
37" Bullard, vertical, 2 swivel heads, 1 turret, 1 plain, used.

LATHES.

13"x 6' South Bend, c. r., h. s., new.	20"x10' Walcott, q. c. g., d. b. g., c. r., h. s., new.
15"x 8' South Bend, c. r., h. s., new.	20"x10' Walcott & Wood, h. s., cpd r., used.
16"x 8' South Bend, c. r., h. s., new.	14"x 6' Fitchburg, s. s., p. r., used.
16"x 8' Walcott, q. c. g., d. b. g., c. r., h. s., new.	
16"x 8' American, q. c. g., used.	

DRILLING MACHINES.

No. 1 Burke, bench, with chucks, new.	34' No. 101 C-O. radial new.
Avey, high speed bench.	20" Silver, s. b., w. & l., new.
Demco, high speed, bench, used.	20" Silver, s. b., b. g., p. f., new.
14" Excelsior, 2 tables, new.	20" Champion, s. b., w. & l., new.
4" Leland Gifford, high speed, with pump.	20" Champion, s. b., b. g. & p. f., new.
	26" Aurora, b. g., p. f., new.
	30" Prentice, s. b., s. h., p. f., used.

SHAPERS.

20" Milwaukee, b. g., latest imp., new.	24" Gould & Eberhardt, used.
18" & 24" Hollingsworth, new.	

SCREW MACHINES.

No. 4 Smurr & Kamen, geared friction head, p. f. to turret, new.
No. 4 Defiance, geared friction head, p. f. to turret, used.
No. 53 National Acme automatic, used.
No. 52 National Acme automatic, used.
Wood Tilted Turret,

MILLING MACHINES.

No. 1 U. S. hand, vise and arbor, new.
No. 2 Pratt & Whitney, Lincoln type.
No. OY Brown & Sharpe, used.

PRESSES.

No. 1 Loshbough-Jordan, o. b. i., new.	No. 53 Swaine, used.
No. 3 Loshbough-J., o. b. i., new.	No. 1 Greenerd, arbor, used, (9).
No. 4 Loshbough-J., o. b. i., new.	No. 2 Greenerd, arbor, used, (6).
No. 3 Kohler, o. b. i., used.	

SAWS.

Nos. 1 & 2 Marvel, draw cut, new.	Williamson, metal, used.
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GRINDERS.

Nos. 1, 2 & 3 Western, d. e., new.	Essley, cylindrical.
Nos. 1, 2 & 3 St. Louis, d. e., new.	No. 190 Wells, reamer & cutter, new.
No. 20 Safety E. W. Co., elec. (4).	Greenfield universal tool & cutter, used.
U. S., electric, 110 v., d. c., bench.	

COMPRESSORS.

Nos. 2, 3 & 4 Model B, vertical, belted, new.
Curtis 8x8 double cylinder, belt drive, (2).

MISCELLANEOUS.

Bolt threader, No. 734 Greenfield, new.	Pipe cutter, B. & K., 4" cap.
Filing mche. No. 2 Cochran-B. used.	Pipe mch., No. 56 Forbes, 4", used.
Motor, 5 h. p. General Electric, 3 ph., new.	Pipe machine, No. 76 Forbes, 3", used.
Motor, 10 h. p. General Electric, 3 ph., new.	Pipe machine, 3" Borden, hand.
Motor, 1 h. p. Advance, sgl. ph., new.	Planer, 36"x36"x12' Patch, o. s., 1 hd. on cross rail, 1 head on side, used.
	Large stock of tinner's tools.

CHUCKS.

5" & 9" 3-jaw Sweetland, scroll, new.	5", 6", 7 1/2", 9" 3-jaw Cushman, universal, used.
8-12-14-16" 4-jaw Sweetland, independent, new.	16" 4-jaw Wescott, combination, cutting off.
No. 18 National Acme, s. o., die hd.	

SECOND-HAND MACHINERY

FOR SALE BY

J. L. Osgood,

45 Pearl St., Buffalo, N. Y.

Chucking lathe, 21" Potter & Johnson, \$350.
Screw machine, No. 5 Warner & Swasey, \$375.
Shell cutting-off machine 14" Williams.
Turret lathe, 12" Brown & Sharpe, \$200.

FOR SALE BY

Brownell Machinery Co.,

11-13 Eddy St., Providence, R. I.

Drills, 2-spindle Allen, b. b.
Drills, 3-spindle Allen, b. b.
Drills, 4-spdl. Henry & Wright, b. b.
Drills, 1-spindle Millbury, 16".
Drills, 5' Prentice radial.
Drills, 6' Newton radial.
Gear cutter, No. 5 B. & S. 48".
Grinder, No. 1 Landis universal.
Grinder, No. 2 B. & S. universal.
Grinder, No. 2 Morse plain.
Grinder, 10"x36 Landis plain.

Grinder, 10"x72 B. & S. plain.
Lathe, 14x 6 Reed, r. & l.
Milling mche., No. 1 Van Norman.
Milling machine, No. 13 Garvin.
Milling machine, No. 21 Garvin.
Milling machine, No. 25 Bilton.
Milling machine, Bristol vertical.
Milling mch., No. 3 Cincinnati plain.
Shaper, 15" P. & J.
Shaper, 16" Ohio.
Shaper, 16" Cincinnati.

FOR SALE BY

The E. A. Kinsey Co.,

Cincinnati, Ohio,

Indianapolis, Indiana

DRILLING MACHINES.

3' Fosdick radial drill.
1/2" type HA-1 U. S. Electric, 220 volts,
60 cycle, 3 phase.

1/2" type T., U. S. Elect. 220 v., 60 cy.
Bausch 4-spindle multiple.

GRINDERS.

16x36 Queen City plain.
No. 2 Cincinnati univ., complete.
14" J. C. Blount wet tool.

Norton No. 1 universal grinder.
Water tool, 26 in. wheel.
Wesche electric buffing, a. c. motor.

LATHES.

14x 6' Monarch, d. b. g., c. r.
16"x 8' Seneca Falls, q. c.
19"x10' Greaves-K., c. r., s. & f. r.

20"x3' Fay & Scott, hex. turret on shears.
20x10' Bradford, 2 c., c. r.

PLANERS.

32"x32"x8' New Haven.
18' Niles-B.-P. plate. 1/2" steel plate.

54-54x30 H. P. Betts; rev. d. c. motor.

TURRET AND SCREW MACHINES.

No. 1 Am. Tool & M. Co., sq. ar., s. b. g., 4 s. c.
3x36 Jones & Lamson flat turret.

No. 2 Warner & Swasey, (2).
No. 2 Garvin, w. f., power feed turret, automatic chucks.

MILLING MACHINES.

No. 2 B. & S. heavy, plain, (2).
No. 3 B. & S. heavy, plain.
No. 3B B. & S. heavy, plain.
48" Newton plain.

No. 3 Cincinnati plain.
Newton 21"x36' double housing slab.
No. 13 Brown & Sharpe plain.
No. 6 Whitney hand miller.

MISCELLANEOUS.

Abrasive metal cutter, 12" Peters.
Band saw, 36" Towsley, with motor.
Bolt cutter, 24" Acme, dbl. spindle.
Boring mill, Pond vertical, 8' table, 11' between uprights.
Centering att., Carrol No. 2, cap. to 2".
Chain machine, Cross & Spiers.
Chuck, 12" universal.
Cutting-off mch., 3" Hurlbut-Rogers.
Gas furnace, No. 93 Stewart dbl. end.
Gear hobber, 18" Gould & Eberhardt.

Gear hobber, No. 3 Farwell.
Hammer, Cement-M. 1500 lb., steam.
Oil pump, Trahern No. 1 F. rotary.
Profiler, Pratt & W. No. 12, belt.
Riveter, 3-16" Schuster on ped.
Saw bench, Beach, table, 36x54".
Special internal grinding fixture Brown & S. for No. 1 universal.
Tapping machine, Garvin No. 1.
Vise, flanged, Brown & Sharpe No. 4.

SECOND-HAND MACHINERY

FOR SALE BY

Girard Machine & Tool Co., 491-493 N. Third St., Philadelphia, Pa.

Engine lathe, 37"x23" Johnson, triple geared and geared face plates, with two sets of raising blocks 49" to 61".
Engine lathe, 28"x12" Fitchburg, double back geared, 7' between centers.
Engine lathes, 28"x13" Wickes, double back geared, heavy duty, q. c. (2).
Engine lathes, 26"x10" Bridgeport, d. b. g., q. c., 4' centers (2).
Engine lathes, 22"x8" Lodge & Shipley d. b. g., q. c., 4' centers, (2).
Engine lathe, 21"x11" Lodge & Davis, taper attachment, 7' centers.
Engine lathes, 20" x 8" Lodge and Shipley, d. b. g., q. c., 4' centers, (2).
Engine lathes, 18" x 6" American, d. b. g., q. c., heavy duty (12).
Engine lathe, 18" x 8" Milwaukee, d. b. g., q. c., heavy duty.
Engine lathes, 17"x6" LeBlond, d. b. g., q. c., heavy duty, (10).
Lathes, 12", 14" and 16" quick change, with various size beds.
Grinder, No. 1 Cincinnati, cutter and tool, standard equipment.
Grinder, No. 2 Bath universal, with standard equipment.
Grinder, No. 13 Brown & Sharpe universal.
Grinder, No. 2 Brown & Sharpe universal.
Shapers, 24" Queen City, 20" and 24" Kelly, 16" Gould & Eberhardt, all late type and back geared.
Turret lathes, 2x24 Jones & Lamson, bar equipment; 21" and 24" Gisholt, late type.

Large lot of Screw Machines, Drill Presses, Punch Presses, etc.
Send for our List.

FOR SALE BY

**Federal Machinery Sales Company,
8 N. Jefferson St., Chicago, Ill. 208 Sycamore St., Milwaukee, Wis.**

BORING AND TURNING MILLS.

Used 30" Colburn single head vertical turret.

Used 42" Gisholt vertical, 2 heads.

DRILLING MACHINES.

New 20" Silver, 2 with w. and l. feed, one with b. g., p. f., (3).

New 24" Hoefler sliding head, back gear, power feed.

New Snyder 28" sliding head, back gear, power feed.

New 36" Cleveland, sliding head, back gear, power feed, automatic stop.

New 3" Mueller plain radial, gearbox drive.

Used 6" Bickford plain radial, cone type.

Used Woodward & Rogers 3-spindle 14" sensitive.

GRINDERS.

New No. 1 Grand Rapids universal cutter and tool.

Used No. 2 Diamond open side surface grinder, table 36"x12".

Used No. 6 Besly disc grinder.

LATHES.

New Dalton type B-4, 6"x36" bench, on legs.

Used 10"x46" Star, l. c. g., compound rest, chuck.

New 11"x4" Blount speed lathe.

New 13"x5" South Bend, compound rest.

New 15"x6" South Bend, compound rest, hollow spindle.

New Oliver 16"x7", quick change gear, regular equipment.

Used 21"x10", l. c. g., compound rest, chuck.

Used 26"x12" Draper, l. c. g., taper attachment.

Used 31"x17" Pond compound rest, single back gear, 26" chuck.

Used 14"x24" gap, 5' bed, Barnes sliding bed gap lathe.

MISCELLANEOUS.

Hammer, drop, 500 lb. Williams & White, used.

Pipe machine, 4" Victor, used.

Press, No. 4 American Can, motor driven, used.

Screw machine, No. 0 Foster, plain head, used.

Shaper, 14" Steptoe, used.

Turret lathe, 20"x8" Bridgeport, used.

The above list is incomplete; write us giving specifications of anything required.

SECOND-HAND MACHINERY

FOR SALE BY

Peninsular Machinery Co., 281 E. Jefferson Ave., Detroit, Mich.

Drill, 20" Rockford, back geared	Lathe, 17"x10' LeBlond automobile.
Drill, 22" Rockford, back geared.	Lathe, 18"x 8' LeBlond engine.
Drill, 24" Rockford, sliding head.	Lathe, 18"x8' LeBlond engine, quick
Drill, 24" Foodick radial.	change gear, motor drive.
Drill, Pierle high spd. ball bearing.	Lathe, 20"x10' LeBlond engine.
Grinder, No. 1 LeBlond univ. cutter.	Lathe, 25"x12' LeBlond engine, h. d.
Grinder, No. 6 Blount, d. e. emery.	Miller, No. 2 1/2 LeBlond universal.
Lathe, 11"x 4' Blount speed.	Miller, No. 3 1/2 LeBlond universal.
Lathe, 14"x 6' LeBlond engine.	Planer, 24x24"x6' Rockford, agl. hd.
Lathe, 16"x 6' LeBlond engine.	Planer, 30"x30"x18, Rockford, 2 hds.
Lathe, 17"x 8' LeBlond rap. produc.	

FOR SALE BY

The Enterprise Machinery Co., 30 S. Clinton St., Chicago

Pit lathe, 9' to 15' swing, tail and rest good for boring mill, 3 1/2" hollow spindle, can use any length bed.	\$2750.
Lathe, 64"x10' New Haven triple back gear, 50" face pl., 2" hol. spdle.	2750.
Drill, Prentice 26" b.g., p.f., s.h.	300.
Drill, Aurora 26" b. g.	195.
Drill, Baker, heavy duty	530.
Drills, Bickford, hvy. duty, (2)	650.
Drill, 3 spindle Rockford, p. f., k. o. pump	400.
Lathe, Lo-swing, like new	1100.
Lathe, 32"x10' p. c. f., c. r., h. s.	750.
Lathes, Morris, 18"x8' d. b. g., turret, (4)	450.
Miller, Garvin No. 2	150.
Riveter, Schuster	95.
Shaper, crank, 10"	165.
Turret lathes, Potter & J. 5A—6A spindle, (8)	

FOR SALE BY

W. J. Baird Machinery Co., 265 Jefferson Ave., E., Detroit, Mich.

Boring mill, No. 1 Lambert horizontal, 3" bar, new.
Boring mill, 30" Gisholt vertical, used.
Boring mill, 40" Bullard vertical, used.
Boring mill, 42" Bullard vertical, used.
Grinder, No. 1 Security internal, new.
Grinder, No. 1 Wilmarth & Morman universal, new.
Grinder, No. 3 Wilmarth & Morman surface, new.
Grinder, No. 1 Fraser universal, new.
Grinder, No. 2 Fraser universal, new.
Grinder, No. 2 Bath universal, used.
Grinders, No. 2 La Salle automatic surface, new (2).
Lathes, 14"x6' Filsmith, double back geared, new, (2).
Lathes, 25"x12' Sidney heavy duty, new, (2).
Lathe, 15"x6' Crawford tool room, new.
Lathes, 16"x8' Bradford, tool room, new, (2).
Lathes, 18"x8' Bradford, q. c., dbl. b. g., new, (2).
Lathes, 6"x30" type B-4 Dalton bench, new, (8).
Lathes, No. 3 Ideal precision bench, new, (4).
Lathes, No. 4 Stark precision bench, new, (2).
Milling machine, No. 3 Cincinnati vertical, new.
Milling machines, No. 2 Rockford high-powered, plain, new, (2).
Millers, No. 1 Rockford hand, new, (3).
Millers, No. 1 U. S. hand, new, (3).
Planer, 22"x22"x5' Wheeler, one head, used.
Planer, 48"x48"x14' Pond, two heads, used.
Planer, 36"x36"x12' American, one head, used.
Planer, 60"x60"x12' Pond, three heads, used.
Shaper, 20" Columbia crank, new.
Shaper, 7" No. 1 Rhodes horizontal crank, new.

SECOND-HAND MACHINERY

FOR SALE BY

The Burke Machine Tool Co.,

Conneaut, Ohio

Gas engine, 40 h. p. tandem Elyria, in good condition, now running...	\$400.
Lathes, 12" taper turning, (2) each	125.
Planer, 18x18x4' Whitcomb	250.
Saw grinder, 30" automatic	75.

FOR SALE BY

Anson W. Richards,

802 Singer Building, New York City

The following offers are bargains:

Automatics, Gridley 2 1/2" single spindle, used, (10).
Automatic screw machines, 3 1/2" Cleveland Model A, new, (3).
Automatic screw machines, 3 1/2"-1 1/2" Cleveland Model A, used, (10).
Bulldozer, No. 25 Williams & White, 20" stroke, excellent condition, used.
Slotter, 60" Newton complete with 220-volt d. c. motor; now operating; fine condition; used.

FOR SALE BY

Herman L. Winterer,

943-53 N. Front St., Philadelphia, Pa.

LATHES.

32"x12' Pittsburgh, d. b. g., q. c. g.	22"x 8' Hamilton, d. b. g., semi-q. c. g., (2).
31"x14' Niles.	21 1/2"x8' LeBlond, (5).
25 1/2"x26' Johnson.	20"x8' 6" Walcott, d. b. g., q. c. g., (2).
26"x10' Niles, d. b. g., q. c. g., (2).	19 1/2"x8' 6" Lodge & Davis.
27"x12' Bridgeford, d. b. g., q. c. g., (2).	19"x10' Draper patent head.
26"x11' Wickes, d. b. g., semi-q. c. g.	18"x 7' Chard, d. b. g., semi-q. c. g., (2).
23"x10' Davis, d. b. g., q. c. g.	And many others.
21"x10' 9" Fitchburg.	

TURRET LATHES.

22" Gisholt.	No. 4 Warner & Swasey, Fox attach.
3"x26" Jones & Lamson.	And many others.
7"x14" Potter & J. semi-auto., (2).	

DRILL PRESSES.

6' Newton radial.	25" Weigel.
40" Barnes horizontal radials, (2).	20" Baker.
36" Bickford radials, circular base, motor driven, (2).	Plain drills, all sizes.
36" Dreses radial.	Drill presses, assorted sizes, (21).

MILLING MACHINES.

36"x8' Ingersoll horizontal.	No. 2A Kemp Smith.
25"x6' Garvin No. 15 slab. q. c. g.	No. 2 Cincinnati univ., table 8x25".
No. 5 Cincinnati, table 9 1/2"x50 1/2".	No. 2 B. & S. univ., table 8 1/2"x37".
No. 15 Garvin, table 12x41 1/2".	Brown & Sharpe, 4"x28" universal table, (2).
No. 15 Garvin, table 12x42".	No. 3 Garvin hand, horizontal.
No. 3H LeBlond univ., heavy duty.	Whitney hand.
No. 3 Cincinnati, table 12x46 1/2".	And many others.
No. 3 Becker Brainard, table 12x40".	

MISCELLANEOUS.

Boring mill, 38" Beaman & Smith.	Grinder, tool room, Heald univ.
Boring mill, 34" Newton car wheel.	Grinder, roll, 54"x10 1/2" Diamond.
Boring mill, 34" Bullard vertical.	Punch presses, all sizes.
Boring mill, 30" Bullard vertical.	Saws, 6" Newton, cold, (2).
Grinder, disc, No. 17 Besly.	

BOILERMAKERS' AND SHIP MACHINERY.

Flanging presses, 100-150 ton capacity.
Hammer, steam, Dudgeon, 1500 lbs. capacity.
Punch, 43" gap Perkins, 1 1/2" in 1 1/2".
Riveter, 8 1/2" Wood hydraulic.

Large assortment of General Machinery. Send for complete list.

SECOND-HAND MACHINERY

FOR SALE BY

E. E. Titchener & Company,

Binghamton, N. Y.

Blacksmith forge, 38x42.
Blacksmith forge, 37x48.
Electric welding machine, 220 v., 60 cycle, 70 k. w.
Shaper, 15" Perkins b. g. crank, actual length of stroke 15", horiz travel of table 13", top of table 9x13 1/2", 10" jaw, swivel base vise; age, about 6 years; condition, good, price, \$260 f. o. b. factory Binghamton, N. Y.
Shaper, 15" single geared swing crank, actual length of stroke 15", horiz. travel of table 10 1/2 x 15", 9 1/2" jaw, swivel base vise, age, about 10 years, condition, good; made by the Geo. Guengst Co., Croton Falls, N. Y.; price, \$230 f. o. b. factory, Binghamton, N. Y.

Hammer, foot, Forging Works.
Planer, 30"x30"x8' Pond.
Punch, b. g., single end, 1" stroke.
Screw machine, 1/2" Hartford auto.
Shaper, 16" Gould & Eberhardt.
Shaper, 16" Gould & Eberhardt.
Shaper, 16" Gould & Eberhardt.
Shaper, 16" Cincinnati.
Shaper, 20" Gould & Eberhardt.
Shaper, 24" Gould & Eberhardt.
Turrets, 24" & 28" Steidle & Gisholt.

FOR SALE BY

Reliance Machinery Sales Co., 114 West Park Way, Pittsburgh, Pa.

Cut-off machine for tubing.
Drill press, 24" Rockford.
Grinder, No 3 B & S., univ cutter & r.
Grinder, Brandes tool, with motor.
Grinders, Yankee drill, all sizes, new.
Lathe, 16"x 8" Hendey, q. c. g.
Lathe, 18"x8" Superior, d. b. g., q. c. g.
Lathe, 20"x 8" Lodge & S., grd. hd.
Lathe, 22"x10" Davis, d. b. g., q. c. g.
Lathe, 26"x10"x 6" Walcott, d. b. g., q. c. g.

Libby lathes, 18", 22" and 26".
Miller, No 4 Garvin universal.
Planer, Pond 72"x48"x16', 2 heads.
Punch, No. 1 Hilles & Jones 7/8x4.
Shaper, 20" Smith-Silk.
Shaper, 16" Gould & Eberhardt.
Shaper, 16" Baush & Harris.
Shaper, 16" Cincinnati.
Shaper, 20" Gould & Eberhardt.
Shaper, 24" Gould & Eberhardt.
Turrets, 24" & 28" Steidle & Gisholt.

Large stock of new and used Grinders, Drill Presses, Hack Saws, etc.

FOR SALE BY

Chas. Molitor Machinery Co.,

124 S. Clinton St., Chicago, Ill.

LATHES.

16"x 8' Monarch, qu. ch. (2).
17"x 8' Cincinnati, qu. ch.
18"x 8' LeBlond, qu. ch.

24"x 8' American, qu. ch., taper backing off attach., turret.
36"x14' Putnam.

MILLING MACHINES.

No. 0—No. 3 Brown & Sharpe, Cincinnati, LeBlond, Cleveland, and Hendey millers, (12).

TURRET LATHES AND SCREW MACHINES.

16" Libby, (2).
3"x36" Jones & Lamson, (3).

22" Greenlee, (3).
16" Wood tilting turret.

SHAPERS AND PLANERS.

20" American, tilting table.
20" Steptoe.
13" Steptoe crank, tilting table.

20" Hendey geared friction.
32"x32"x8' Betts.
22"x22"x5' Hendey planer.

PUNCH PRESSES AND HAMMERS.

No. 57 Toledo, straight b. g.
No. 3 Ferracuta, horning, b. g.
No. 68 Bliss double action.
No. 3 Royersford dbl. p. & shear.

Bradley hammer.
Bowman spring hammer.
38" 42" Arch presses.
No. 6 Whiting punch.

DRILL PRESSES AND TAPPING MACHINES.

24" Barnes, sliding head.
1 & 2 spindle Avey bench drills.

4 sp. Acme nut tapper.
Rickert-Shafer tapping mchs., (3).

MISCELLANEOUS.

Broaching mchs., No. 2 Lapointe, (2).
Drilling & mill. mche., No. 1 Knight.
Gear cutter, 36" Gould & Eberhardt.
Gear cutter, 48" Gould & Eberhardt.
Grinder, 18"x 9" Landis auto. pl.
Grinder, 17"x32" Landis auto. pl.

Grinder, 10x36 Thomson auto. univ.
Grinder, 4-sp. Foote-Burt vert. cock.
Miller & grinder, Saxon vertical.
Miller, No. 2 Becker vertical.
Pipe threaders, 2"-4".
Rotary grinder, N. Y. Safety Co.

SECOND-HAND MACHINERY

WANTED BY

Kreiter Machine Co.,

205 San Jacinto St., Houston, Texas

STEAM HAMMER.

We are in the market for a 2,000 lb single frame steam hammer, late model. Either in good condition or otherwise, except that no parts should be broken. Send price, description and picture in first letter.

FOR SALE BY

Cleveland Belting & Mchy. Co., 1922 Scranton Rd., Cleveland, O.

SPENCER ENGINEERING CO. MACHINERY

List of Machinery at the Spencer Engineering Co., Toledo, O.

Air chucks, with air cylinders and connections, (32).

Air hoist, 14" diameter, 8' lift.

Air hoists, 8" bore, 8' lift, (2).

Air tanks, with valves & gauges, (2).

Annealing furnace, 8'x32" Quigley.

Boring mill, Betts vertical, 7' or 10', single head on cross rail.

Grinders, wet, Townsend, (14).

Grinding jacks, various sizes, (3).

Hydraulic accumulator.

Hydraulic banding presses, (2).

Hydraulic pump.

Lathes, engine, 18" American, d.b.g., 6' bed, (22).

Lathes, engine, 18" American, d.b.g., 6' bed, (21).

Miller, Gould & Eberhardt No. 4.

Lathes, engine, 18" American, grd. hd., single pulley dr., 8' bed, (9).

Lathes, turret, 16" American, d.b.g., 8' bed, (14).

Lathes, turret, 18" American, grd. head, 8' bed, (11).

Oil pump, cap. 5 gallon per minute.

Roller marking machines, (2).

Shell spraying machines, (2).

Shot blast machines, Gray, (3).

Steel tank, 3 bbl. 42x36x30 deep.

Steel tank, 10 bbl., 5x6x3'4", steam jacketed.

Thread millers, Smalley-General, equipped with air chucks, air cylinders and valves, (10).

Tool hardening furnace.

There is also in this plant a large quantity of pulleys, all sizes, line shafting, hangers and belting of all descriptions. Also a large stock of tool room and stock room supplies.

FOR SALE BY

B. C. Allen Machinery Co.,

104 S. Clinton St., Chicago

Air compressor, dbl., 2 1/2"x4"..... \$ 20.

Bolt cutter, 1 1/2" Merriman..... 2.25.

Brake, Cornice, 4'..... 60.

Drill press, 18" Barnes..... 75.

Drill press, 18" Rockford..... 65.

Drill, 20" wheel & lever..... 75.

Drill, 20" b. g., p. f., new..... 160.

Drill, 24" sld. hd., b. g., p. f..... 250.

Drill, 26" sta. hd., p. f..... 150.

Drill, 13" 3-spindle sensitive... 100.

Drill, 14" 4-spindle sensitive... 150.

Die grinder, new..... 80.

Emery grinders, Nos. 1, 2, 3 & 4.

Forge, with hood..... 15.

Hack saw, 7"x8"..... 25.

Hack saw, Racine high speed..... 90.

Lathe, 13"x34" Sebastian..... 200.

Lathe, 17"x12" Bement Miles..... 425.

Lathe, 18"x 6" Lodge & Davis..... 375.

Lathe, 18"x 6" S. & Boye..... 575.

Lathe, 18"x 6" American, q.c.g..... 600.

Lathe, 26"x16" Wright..... 700.

Lathe, 14" Fox..... 200.

Lathe, 12" Warner & S. turret \$ 100.

Miller, No. 2 Hendey, q. c. g. 850.

Miller, No. 5 Burke, hand..... 300.

Motor, 1/2 h. p., a. c., sgl. phase,

60 c., 110-220 v..... 25.

Motor, 1/2 h. p. 3 p. 60 c. 220 v..... 45.

Motor, 2 h. p. 3 p. 60 c. 220 v..... 75.

Motor, 10 h. p., d. c., 220 v..... 240.

Planer, 22"x22"x5'..... 450.

Planer, 27"x27"x7'..... 300.

Punch press, No. 2 sta..... 135.

Punch press, No. 4 Niagara inc. 225.

Punch press, L. Jordan No. 4 500.

Punch press, No. 4, not inc..... 350.

Punch press, foot..... 35.

Screw machine, 1 1/2" f. head..... 375.

Shaper, 14" geared..... 250.

Shaper, 20" crank, plain..... 550.

Shaper, 24" geared..... 400.

Tinners' rolls, 16"..... 12.

Tinners' rolls, 30"..... 20.

Tinners' rolls, 35"..... 45.

Tinners' rolls, 50"x4"..... 75.

SECOND-HAND MACHINERY

FOR SALE BY

Somers, Fittler & Todd Company, 329 Water St., Pittsburgh, Pa.

MILLING AND DRILLING MACHINE.

Used No. 2 Knight Combined Milling and Drilling Machine with regular attachments; available immediately; a bargain. For further details and prices write or wire as above.

FOR SALE BY

A. A. McLaughlin & Company,

44 Atlas Bank Building,

Cincinnati, Ohio

Used Machine Tools ready for Quick Order.

Hammer, 50 lb. Little Giant, power.....	\$ 250.
Hammer, 80 lb. heavy frame trip.....	500.
Hammer, 165 lb. Williams Justice, spring.....	700.
Lathe, 15" x 6' Pratt & Whitney, hollow spindle.....	300.
Lathe, 16" x 5' Buckeye turret lathe.....	95.
Lathe, 17" x 8' G. & K. hollow spindle, with turret head.....	400.
Lathe, 18" x 8' Lathe & Morse.....	250.
Lathe, 22" x 11' Lodge & Davis, hollow spindle.....	800.
Lathe, 24" x 10' Schumacher & Boye, hollow spindle.....	850.
Planer, metal, 30" x 6' bed, Gould Bros.....	450.
Punch, power, Faust & Bradley, 13 1/2" throat.....	350.
Punch and shear, double, power, No. 4 Long & Allstatter.....	500.
Shear, power, 28 1/2" throat.....	450.
Tumbling barrels, 36x50 cast iron.....	165.

A large stock of Iron and Wood-Working Machinery.

FOR SALE BY

E. L. Esley Machinery Co., 551-557 Washington Blvd., Chicago, Ill.

DRILL PRESSES.

5' Niles full universal radial.	20" x 4 spindle Barnes all geared gang.
No. 1 Avey single spindle.	No. 1 W. F. & J. Barnes, horiz. drill.

GRINDERS.

No. 1 Cincinnati, universal.	No. 1 Norton univ. cutter & reamer.
No. 190 Wells cutter and reamer.	No. 2 10" x 32" Ott universal.

LATHES.

11" x 6' Star, draw-in att. turret on shears.	20" x 8' Hamilton.
16" x 8' Von Wyck, taper att.	22" x 12' Greaves & Klusman.
17" x 8' LeBlond heavy duty.	24" x 12' Prentice Bros.
18" x 8' Bradford, q. c. g., taper att.	36" x 14' Bradford.

SCREW MACHINES.

1 1/2" & 3" Cleveland full auto.	No. 3 Foster, plain head (7).
No. 5 Pearson, hand, fric. head.	No. 4 Foster, plain head (5).
1" x 15" Pratt & Whitney, plain head.	1" Smurr & Kamen, plain head.

MISCELLANEOUS.

Boring mach., No. 0 Fosdick.	Pipe machine, No. 9 1/2 Merrell.
Broaching machine, No. 3 Lapointe.	Planer, 26" x 22" x 6' Gleason.
Cold saw, No. 14 Higley.	Planer, 32" x 32" x 12' Davis & Egan.
Gear cutter, No. 3 B. & S. auto.	Planer, 42" x 42" x 6' Whitcomb.
Miller, hand, No. 2 P. & W.	Punch, Sellers single end, 26" thr.
Miller, No. 2 1/2 Hendeley, Lincoln type.	Turret lathe, 2" x 24" J. & L.

SECOND-HAND MACHINERY

FOR SALE BY

Earl W. Conrad,

Warsaw, Indiana

NEW TRIMMING PRESSES.

Three brand new No. 3 Pratt & Whitney trimming presses; a bargain if taken at once.

FOR SALE BY

C. M. Thompson Co.,

35 S. Clinton St., Chicago

Drill presses, floor, 14".
Drill, Leiman Bros. jewelers', motor driven.
Grinder, 220 v., d.c., Cincinnati Elect.
Grinder, 220 v., d. c., tool post.
Lathe, 13"x8" Lancaster.
Lathe, 14"x8" Champion Tool Wks.
Emery Grinders, small

Lathe, 14"x6" Flather, taper attach.
Lathe, 18"x8" Flather.
Lathe, 26"x16" Wright, solid spdl.
Milling machine, Cox.
Screw machine, hand, No. 2 P. & W.
Turret lathe, 2" J. & L., cone head.
Turret lathes, 2"x24" J. & L., late type.
High Speed Motors, etc.

FOR SALE BY

The Wm. T. Johnston Co.

3rd & Vine Sts., Cincinnati, Ohio

LATHES.

36"x16" New Haven.
32"x16" Perkins.
32"x16" Ferris & Miles.
26"x9" Bridgeford.
25"x12" LeBlond.
24"x12" Bradford. (2).
24"x16" Porter.
22"x8" Davenport.

20"x10" American.
20"x8" Lodge & Shipley Co.
18"x8" LeBlond. (8).
18"x6" Whitcomb Blaisdell.
16" Various makes, (10).
14" Various makes, (4).
13" Various makes, (6).
12" Various makes, (5).

TURRET LATHES.

2" Cleveland automatic screw machine.

PLANERS.

30"x30"x3" American.

RADIAL DRILLS.

3" Western.

SHAPERS.

18" Hollingsworth.
12" Lodge & Davis.

BORING MILLS.

GEAR CUTTERS.

18"x4" Gould & Eberhardt automatic.

MILLING MACHINES.

No. 3 Cincinnati.
No. 2 Brown & Sharpe, (6).

W. S. Machine T. Co., (2).

DRILL PRESSES.

30" Aurora.
28" Barnes.
24" Barnes, (2).
21" Kern.

20" Barnes, (2).
14" Allen.
14" W. S., (2).
24" Baker.

GRINDERS.

No. 60 Heald, cylinder.
12x32 Landis.
10x24 Landis.
No. 2 Oakley.

No. 1 Cinti. universal, (3).
No. 1 Woods, (3).
No. 1 Oesterlein.

MISCELLANEOUS.

Air compressors, (6).
Blowers, 60", (2).
Duplex pumps, (7).

Engine, 7x14 Brownell.
Kick presses, (2).
Steel tanks, (6).

SECOND-HAND MACHINERY

FOR SALE BY

The Osborne & Sexton Machinery Co.,

Columbus, Ohio

LATHES.

9" to 13" Barnes, h. s., cp. r., new.
13-15-16 and 18 O. & S., h. s., c. r., new.
18"x 8" Fitchburg, hol. spdl., cp. r.
19"x12" Gray, compound rest.

20"x10' Hamilton, double back gear.
21"x10' and 24"x12' South Bend.
25"x24' Fifeild.
30"x12' Star, hollow spdl., cp. rest.

TURRET LATHES AND

No. 52 to 56 National Acme.
No. 2 W. & S. hollow hexagon.
Wells hand screw machine.
1" Garvin hand screw machine.

SCREW MACHINES.
18" S. & K. hand screw mches., (3).
12" Tilted turret hand screw mche.
2x24 & 3x36 J. & L., dbl. equipment.
4" Hartford single spindle auto.

SHAPERS AND PLANERS.

14" Niles, traveling head.
16, 18 & 24" Barker, back gear crank.
16" Kelly crank, back geared.
20" Walcott geared shaper.

22"x22"x 6' Gray, 1 head.
32"x32"x10' Niles, single head.
36"x36"x16' Niles, double head.
60"x60"x17' Betts, double head.

PRESSES.

No. 1 Consolidated and Toledo, (10).
No. 2 Sidney o. b. inclinable, 1600 lb.
No. 32-P Toledo, (2).

No. 19½ Bliss, with feeding attach.
Perkins, dbl. crank, 16x24 bolster.
Covington, 10' 6" between housing.

DRILLS AND RADIALS.

Henry & Wright sgl. spdl., high spd.
3½" Canedy-Otto plain, new.
4" Haush plain, heavy pattern.
4½" Universal, cone drive.
Sensitive 1, 2 & 3 spindle.

High speed sgl. spdl. Cleveland.
20" Aurora, with tap. attachment.
30" lever feed, (30).
24", 26" and 28" sliding head.
Quint 6-hole turret drill.

MILLING MACHINES.

No. 2 Kempsmith plain, (2).
No. 25 Becker plain, (3).
Ames Lincoln type, 10"x40" table.
No. 12 Brown & Sharpe, (2).

No. 1½ Valley City universal.
No. 4 Cincinnati plain.
No. 1½ Valley City plain, new.
No. 3 Brainard, 30x7 table.

GRINDERS.

No. 3 W. & M. wet surface
6x18 Landis, plain.
Capital, internal, practically new.
Landis 10x24 universal

Litter 10x20 universal.
30x10 Webster & Perks, univ., new.
Cutter, reamer and tool, new.
Cincinnati cutter and tool.

MISCELLANEOUS.

Balancing machine for pulleys.
Band saws, metal, 30" Wright, (2).
Boring mill, 12", 2 swivel heads.
Compressor, 8"x8" H. & B. belt.
Cut-off machine, 3" Davis.

Dynamo, plating, 2500 amp., 8 volt.
Hammer, 40 lbs. Bradley helve.
Hammer, 55 Williams White Justice.
Motor, 75 h. p., 220 volt, 3 phase.
Pipe machines, 4, 6 and 12".

Second-Hand Wood-Working Machinery

For a large list of used wood-working machinery, consult the **Wood-Working Machinery List**, a publication similar to this but devoted to the advertising of saw-mill and wood-working machines. A copy may be had on application to the publisher, **A. H. Hitchcock, 1220-1235 Caxton Building, Chicago, Ill.**

New Machinery For Sale

In Stock at Chicago and New York

Lathes

- | | |
|---|---|
| 26"x12' Wickes, q. c. g., d. b. g. | 14"x 6' Amtew, d. b. g. |
| 24"x13' Chard, q. c. g., d. b. g. | 13"x 6' Lancaster. |
| 24"x10' Advance, q. c. g., d. b. g. | 12"x 4' 6" Cleveland precision, (4). |
| 20"x11' Chard, q. c. g., d. b. g., (2). | 12"x 5' 6" Davis tool room, (2). |
| 20"x 9' Chard, q. c. g., d. b. g. | 12"x 4' 3" Shepard. |
| 18"x 9' Chard, q. c. g., d. b. g., (5). | 11"x 5' Hudson. |
| 18"x 8' Advance, q. c. g., d. b. g. | 11"x 4' No. 100 Wells, speed lathe. |
| 16"x 9' Chard, q. c. g. | 6"x30" Dalton bench lathe. |
| 16"x 8' Cisco, q. c. g. | 4"x 5' Elgin precision bench lathe. |
| 16"x 8' Cleveland, tool room. | No. 54 Sloan & Chase bench lathe. |
| 16"x 7' Chard, q. c. g. | Full line, Rivett precision bench lathes. |
| 16"x 6' Cleveland tool room, (3). | |

Drilling Machines

- | | |
|----------------------------------|---|
| 44' Morris plain radial. | 21" Cleveland upright, (9). |
| 4' Western heavy pattern plain. | 20" Canedy-Otto, upright, (4). |
| 3' Western manufacturing radial. | 20" Wisconsin, all-g geared. |
| 34' Canedy-Otto radial, (3). | 20" Milwaukee, lever feed, (2). |
| 36" Snyder traveling head. | Nos. 1, 2 & 3 spdl. Demco, h. s., b. b. |
| 32" Cleveland sliding head, (3). | 2 spindle Cleveland, h. s., b. b. |
| 28" Cleveland sliding head, (3). | 14" U. S. sensitive. |
| 25" Cleveland, upright. | Belt driven bench. |
| 25" Silver sliding head. | Motor driven bench. |
| 23" Snyder upright, (8). | Portable electric. |
| 224" Cleveland upright, (5). | |

Milling Machines

- | | |
|---------------------------------|----------------------------------|
| No. 2 Cleveland universal, (6). | Nos. 1-A, 1-B and 0-B Fox plain. |
| No. 2 Cleveland, plain. | No. 1 U. S. hand miller. |
| No. 2-A Fox universal. | No. 3 Becker standard vertical. |
| No. 2-B Fox plain, (3). | |

Grinders

- | | |
|----------------------------------|--------------------------------------|
| No. 3 Modern universal, (2). | No. 1 Grand Rapids, cutter and tool. |
| No. 3 Wilmarth & Morman surface. | Grand Rapids drill—various sizes. |
| No. 2 Reid surface, (2). | Yankee drill—various sizes. |
| Hartford improved surface. | 5x18 Ott plain. |
| 24" Milwaukee wet tool. | Partridge floor stand—various sizes. |
| Cleveland profile. | Portable electric. |
| No. 1 Norton cutter and tool. | Full line Rivett precision internal. |

Miscellaneous

- | | |
|---------------------------------------|---------------------------------|
| Arbor presses, Atlas, all sizes. | Shaper, 16" Walcott. |
| Filing machine, Nos. 2 & 3 Harry. | Shaper, 18" Barker. |
| Gear hobbess, No. 3 Farwell, (2). | Shaper, 20" Walcott. |
| Hack saws, Peerless, 6x6, 9x9 & 13x16 | Shaper, 20" Milwaukee. |
| Hack saw, No. 1 Racine. | Shaper, 24" Milwaukee. |
| Punch press, No. 1 Rockford. | Shaper, 24" Barker. |
| Fullness and shear, No. 12 Beloit. | Full line Pexto Tinnars' Tools. |

USED MISCELLANEOUS

- | | |
|------------------------------------|----------------------------|
| Drilling and tap'g mche., Murchey. | Shaper, 20" Rockford. |
| Grinder, tool post. | Turret lathe, 24" Steidle. |

Dale-Brewster Machinery Co., Inc.

541-7 W. Washington Blvd., - - - Chicago

54-60 Lafayette St., - - - New York

Address all inquiries attention Department A

Our Guarantee— Money Back if Not Satisfied

Pipe Machines

- 1—No. 306-B Oster Pipe Machine, capacity $1\frac{1}{2}$ " to 6"; arranged for motor dr.
- 1—Williams No. 1 Pipe Machine, capacity $\frac{1}{2}$ " to 2"
- 1—No. 38 Forbes Hand Pipe Machine, capacity $1\frac{1}{2}$ " to 4".

Grinders

- 1—No. 2 Manhattan Surface Grinder. BRAND NEW. Working surface of table $7\frac{1}{2}$ by 36"; longitudinal movement 38".
- 1—No. 2-A Landis 16x32 Universal Grinder.
- 2—Gardner No. 120 Double Disc Grinders.
- 1—C-T Grand Rapids Drill Grinder, capacity $\frac{1}{2}$ " to $2\frac{1}{2}$ ".
- 1—Each Nos. 1, 2 and 3 Woods Univ. Tool & Cutter Grinders, complete, (new).

Millers

- 2—No. 1 $\frac{1}{2}$ American Plain Milling Machines. (new).
- 1—No. 2-B Rockford Universal Milling Machine. (new).
- 2—No. 0 Bickett Vertical Profilers and Millers.
- 2—U. S. Hand Millers.
- 1—No. 2 American Plain Miller.

Lathes and Turrets

- 2—24" Gisholt Lathes, chucking equipment, taper attach., modern machines.
- 1—24"x14" Thayer & Houghton Lathe.
- 1—Each New Sidney Heavy Duty Lathes, 15", 17", 19", 23" and 27" swing by 6', 8', 10', 12' and 14' beds; standard lathes; all 3-step cone, d. b. g., q. c.
- 1—Each New Sidney 14", 16" and 18" swing by 6', 8' and 10' beds; standard lathes; all 3-step cone, d. b. g., q. c.
- 2—14"x6" Flather & Co. Lathes.

Drills—Radials and Multiples

- 1—4' Universal Radial Drill.
- 1—No. 30 Natco 34-spindle Multiple Drill.
- 1—Baush 12-spindle Multiple Drill, equipped for 24 spindles; weight 30,000 lbs.; capacity $\frac{1}{2}$ " to $1\frac{1}{2}$ ".
- 2—24"—28" Hoefler, s. h., b. g., p. f. Drills.
- 1—22" Barnes Sliding Head, b. g., p. f. Drill.

Miscellaneous

- 1—26" by 24" by 8' David W. Pond Planer.
- 1—6-A Toledo Butt Welder.
- 1—No. 3 Long & Allstatter Welder.
- 1—No. 2 Royersford Double End Punch and Shear; $7\frac{1}{2}$ " throat; capacity to punch $\frac{1}{2}$ " through $\frac{1}{2}$ ".
- 1—No. 7 Long & Allstatter Punch and Shear; $3\frac{1}{2}$ "x $3\frac{1}{2}$ " capacity. 4" throat.
- 1—No. 112 Badger Alligator Shear; capacity 6x $\frac{1}{2}$ " flat, $1\frac{1}{2}$ " round iron.

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Wayne Machinery Company
Fort Wayne, Indiana

Branch Office and Warehouse: 18 W. Second St., Dayton, Oh

Used Machinery

LATHES.

- 15x 6 Miami Valley Engine Lathe with C. R.
- 16x 8 Monarch Standard Engine Lathe with C. R.
- 16x 8 Reed Lathe with elevating rest.
- 17x 6 LeBlond Heavy Duty Manufacturing Lathe with turret on carriage.
- 18-25x 6 Rahn-Mayer-Carpenter Gap Bed Lathe.
- 19x10 LeBlond Heavy Duty Manufacturing Lathe, plain rest, taper longitudinal stops, taper attachment.
- 20x14 Monarch Standard Engine Lathe, with C. R.
- 20x14 Reed Lathe with C. R.
- 24x12 New Haven Lathe with C. R.
- 24x12 American Tool Works Single Pulley Drive, Geared Head Lathe, C. R., Q. C. G.
- 26x14 Pratt & Whitney Lathe with swivel rest, T. A.
- 26x10 Hamilton Lathe with C. R., Q. C. G., Special Ball Turning Rest, Hexagon Turret mounted on ways.

PLANER AND SHAPERS.

- 26x26"x5' New Haven Planer with one head on cross rail.
- 2-20" Hendey Pillar Shapers.
- 20" Ohio Machine Tool Co.'s Crank Shaper.
- 20" Back Geared "Queen City" Crank Shaper.

DRILLING MACHINES.

- 14" Leland-Gifford High Speed Ball Bearing Drill.
- Three-Spindle 16" Sipp High Speed Ball Bearing Drill.
- 14" 4-spindle Cleveland High Speed Ball Bearing Drill with Tapping Attachment on each spindle.
- No. 11 Eight-spindle NATCO Multiple Spindle Drill with 12 in circular hd.
- 4' arm Fosdick & Holloway Plain Radial Drill.

GRINDERS.

- 10x20 Acme Universal Cutter and Tool Grinder.
- No. 1 Norton Universal Cutter and Tool Grinder.
- No. 1, 10x24 Brown & Sharpe Universal Grinder.
- No. 14, 10x36 Brown & Sharpe Plain Manufacturing Grinder.
- 22x84 Pratt & Whitney Heavy Vertical Surface Grinder, driven with 40 H. P., 3-phase, 60-cycle, 220 volt Motor.
- 16" Cleveland Hole Grinder.

MILLING MACHINES.

- No. 2 Becker-Brainard Universal Milling Machine.
- No. 1, Kearney & Trecker Double Over-Arm Universal, with rotary table.
- No. 1, Kearney & Trecker Double Over-Arm Universal, with vertical milling attachment, slotting attachment.
- No. 2 Becker Vertical Milling Machine with rotary.

MISCELLANEOUS.

- 4" Hurlbut-Rogers Cut-off Machine.
- 24" Bar Niles Cone Type Horizontal Boring Machine.
- 4x80 Pratt & Whitney Thread Miller.
- 40-lb. Bradley Helve Hammer.
- Electromobile Truck, carrying capacity 3,000 lb., pulling capacity, 10,000 lb., two four-wheel wagon trailers and charging outfit.
- Type 3-V. S.—23 NATIONAL BRAKE & ELECTRIC CO'S Motor Driven Air Compressor; having a piston displacement of 300 cu. ft. per minute against 90 lb. pressure; including 54 H. P. Allis-Chalmers three-phase, 60 cycle, 220 volt A. C. Motor. Type HB Control, comprising automatic governor, unloader and water valve; all mounted on common bed-plate, making complete self-contained unit.

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36" Bullard Vertical Turret Lathe.

GEAR CUTTERS.

- 1 No. 3 26" Brown & Sharpe.
- 2 36"x9" Gould & Eberhardt, Horiz. Type.
- 1 No. 2 Whiton Automatic.

DRILLS—Radial.

- 5' Cincinnati.
- 6' Prentice.

GRINDERS.

- 3 No. 60 Heald Cylinder Grinders (for belt motor drive or standard belt drive).
- 2 10x36 Norton Plain.
- 1 10x50 Norton Plain.
- 3 14x72 Norton Plain.

LATHES.

- 2 16"x 8' Lodge & S., G. H., taper att.
- 1 16"x 8' Monarch.
- 1 16"x 10' Rahn-Larmon (Stud).
- 22"x 14' Niles.
- 24"x 10' Lodge & Shipley G. H.
- 30"x 14' Pond.
- 9"x 12' Sundstrand.
- 4 21"x 10' South Bend.
- 8 8"x 60" Lo-Swing.

TURRET LATHES & SCREW MCHS.

- 10 3 1/4"x 36" Acme (turret).
- 6 2 1/4"x 26" Acme (flat turret).
- 1 No. 7 Bardons & Oliver.
- 1 3/4"-1/2" Plain Cleveland.
- 1 2" Cleveland.
- 1 1 1/2"x 7" Acme.

belt motor drive or standard belt drive).

6 2 1/4" x 26" Acme (flat turret).

No. 7 Bardons & Oliver.

1 3/8" - 1/2" Plain Cleveland.

1 2" Cleveland.

1 1 1/2" Acme.

3 24" Gisholt.

3 21" Gisholt.

MILLING MACHINES.

4 Type "A" Briggs, 36" table.

10 No. 6 Whitney Hand.

6 8" Pratt & Whitney Automatic.

4 10" Pratt & Whitney Automatic.

PISTON RING MACHINES.

5 Gridleys (Plain and Eccentric).

2 No. 2-P Potter & J., (Plain & Eccentric).

Yes! We are interested also in the purchase of metal working machines providing they are not obsolete.

THE NOTCH & MERRYWEATHER MACHINERY CO

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New Boston Show Rooms W. H. J. Fitzgerald & Co.

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- 2 No. 2 Warner & Swasey Turret Screw Machines, plain head, automatic chuck, bar feed, hand longitudinal feed to cut-off, with power feed to hexagon turret.
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These machines are in A-1 condition.

Six $\frac{1}{4}$ Inch Automatic Screw Machines (Stehli Patent)

Each fitted with screw slotting attachment. Manufactured by Hartford Machine Screw Company. These machines adapted to the rapid production of all kinds of small screws, bushings, studs, etc. Condition, good as new.

NEW MACHINES IN STOCK

- 23" and 25" Snyder Drill Presses.
- 16" Bradford Lathe, 8' Bed.
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- No. 6 Bickett Profiling Machine.
- No. 1 Toledo Hand Milling Machines.
- 16" Ohio Shaper.
- No. 1 Kempsmith Universal Milling Machine.
- 10x30 Webster & Perks Universal Grinder.
- Webster & Perks Nos. 1 and 2 Floor Type Grinders.
- No. 1 Wilmarth & Morman Universal Grinder.
- No. 2 Grand Rapids Universal Grinder.
- No. 2 Garvin Screw Slotting Machine.
- No. 32-B Demco Floor Type Drill Presses, two and three-spindle.

USED MACHINES IN STOCK

- 3 $\frac{1}{2}$ " Gridley Automatic, single spindle.
- 2 Fosdick Radials.
- No. 3 Ohio Universal Tool & Cutter Grinder.
- 2x24 and 3x36 Jones & Lamson Turret Lathes.
- No. 14 Besly Disc Grinder.
- 12"x6" and 24"x12" Gould & Eberhardt Gear Hobbers.
- No. 1 Brown & Sharpe Automatic Screw Machine.
- No. 7 Foster Hand Screw Machines.
- No. 2-26" and No. 3-36" Brown & Sharpe Gear Cutters.
- No. 1 two-spindle Garvin Tapping Machine.
- No. 1 Wilmarth & Morman Surface Grinder.
- No. 1 Warner & Swasey Hol. Hex Turret Lathe.

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Used Machine Tools

- 1—42"x42"x26' J. S. Wheeler Planer.
 - 1—No. 2½ Avey Drill, with tapping att.
 - 1—No. 2 Van Norman Duplex Milling Machine.
 - 1—No. 1 Kempsmith Plain Milling Machine.
 - 1—48" Drill, Back Gear.
 - 1—16"x6' Hendey Lathe.
 - 1—Lo-swing Lathe.
 - 1—14"x5' Lodge & Shipley Lathe, with taper attachment.
 - 1—3' Bickford Radial Drill.
 - 2—30 H. P., 220 Volt, 60 Cycle, 3 Phase, R. & M. Motors.
 - 1—40 H. P., 220 Volt, 60 Cycle, 3 Phase, G. E. Motor.
-
-

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Indianapolis, Ind.

Exceptional Value in Tools

New Or 98% New

- 2—16x52 Landis Plain Self-Contained Grinders.
- 1—No. 2 Wilmarth & Morman Surface Grinder.
- 2—16x10 Blount Speed Lathes.
- 2—13x 6 Blount Speed Lathes.
- 2—16x12 Lodge & Shipley Lathes, with pan and pump.
- 1—3" Jones & Lamson Lathe, with chucking equipment.
- 1—21" Gisholt Lathe, motor drive, 220 volt motor.
- 2—16" Acme Universal Turret Lathes with chasing bar.
- 1—14x6 Walcott Double Back Geared Lathe.
- 1—16x8 Walcott Double Back Geared Lathe.
- 1—18x8 Walcott Double Back Geared Lathe.
- 1—20x8 Walcott Double Back Geared Lathe.
- 1—No. 4 National Screw Machine, friction head.
- 1—Grant No. 81-A Riveting Machine.
- 2—16" Ohio Shapers, 1 Plain, 1 Heavy Duty.
- 2—20" Ohio Standard Duty Shapers.
- 1—24" Ohio Standard Duty Shaper
- 1—24x24x8' Ohio Planer.

The H. A. Smith Machinery Co., Inc.

501-505 East Water St.,

Syracuse, N. Y.

Second Hand Machinery

DRILLING MACHINES.

Demco bench drills, new, (5).

18" Baker, stationary head, hand lever and power feed.

No. 117 Moline heavy single spindle, (2).

GEAR CUTTERS.

48"x10" Gould & Eberhardt new type for spur gears only, (2).

ENGINE LATHES.

16" Reed stud lathe.

16"x 7' semi quick-change gear lathe.

18"x 6' Imperial chucking lathe, with turret.

21"x10' LeBlond crankshaft lathe.

24", raised to 30", Lodge & Shipley, patent head.

30"x10' Fifield, compound rest.

32"x16' Fay & Scott, compound rest, tur. on shears, turret tool post.

Bridgeport automatic threading lathe.

TURRET LATHE.

24"x26" Acme flat turret, with bar and chucking equipment.

PLANERS.

36"x36"x12' Gray, 2 heads.

SHAPERS.

28" Steptoe, shifting belt.

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Re-MANUFACTURED - (ORIGINATED BY US) - MACHINE TOOLS

Real Bargains

Every Re-Manufactured machine is being offered at real bargain prices. In fact, we can sell our Re-Manufactured tools, which compare favorably with new, at prices lower than those of the ordinary used tools.

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- 1-14"x 6' Reed Engine.
- 42-14"x 6' Reed. Ex. Hvy., Pl. Eng.
- 7-16"x 6' Reed Engine.
- 1-16"x 6' Reed Engine.
- 1-16"x 7' Reed Engine.
- 14-17"x 6' LeBlond Rapid Prod.
- 10-17"x 6' LeBlond Engine.
- 8-17"x 8' LeBlond Engine.
- 21-18"x 8' Boye & Emmes Eng.
- 8-18"x 8' Boye & Emmes.
- 20-18"x 8' LeBlond Engine.
- 1-18"x 8' Lodge & Shipley.
- 3-18"x 8' American Engine.
- 65-19"x 8' LeBlond Engine.
- 35-19"x 8' LeBlond Eng., P. F. T.
- 17-20"x 8' LeBlond Engine.
- 17-20"x 8' American Eng., P. F. T.
- 113-20"x 8' American Engine.
- 2-21"x 8' LeBlond Engine.
- 58-21"x 10' LeBlond Engine.
- 14-25"x 10' LeBlond Engine.
- 2-26"x 12' Wickes Engine.
- 33-26"x 10' Niles Engine.
- 3-26"x 12' Putnam Mtr. Driv. Eng.
- 75-26"x 10' Bridgeford Engine.
- 30-26"x 12' Bridgeford Engine.
- 16-26"x 14' Bridgeford Engine.
- 7-26"x 16' Bridgeford Engine.
- 10-26"x 18' Bridgeford Engine.
- 5-26"x 20' Bridgeford Engine.
- 9-30"x 11' American Gd. Hd. Eng.
- 3-30"x 15' American Gd. Hd. Eng.
- 3-30"x 20' American Gd. Hd. Eng.
- 23-32"x 12' Pittsburgh Engine.
- 6-40"x 12' Fife Engine.
- 4-40"x 18' Fife Engine.

GRINDERS.

- 3-10"x 36" Norton Plain.

GRINDERS-CONTINUED.

- 1-10"x 50" Norton Plain.
- 3-12"x 24" Modern Plain.
- 1-12"x 42" Cincinnati.
- 1-No. 1 Bath.
- 1-No. 22 Brown & Sharpe Internal.
- 1-36" Pratt & Whitney Vertical.
- UPRIGHT & RADIAL DRILLS.
- 1-3 spindle Allen Sensitive.
- 2-4 spindle Allen Sensitive.
- 1-34" Barnes Sliding Head.
- 1-No. 25 Foote-Burt.
- 3-3' American Sensitive.
- 1-3' Fosdick Plain.
- 1-5' Putnam.

MILLING MACHINES AND GEAR CUTTERS.

- 1-No. 20 Osterlein Universal.
- 3-No. 1A Brown & Sharpe Univ.
- 1-No. 1B Brown & Sharpe Plain.
- 1-No. 2A Brown & Sharpe Univ.
- 1-No. 2A Hendey Universal.
- 1-No. 2G Hendey Universal.
- 1-No. 9 Kempsmith Plain.
- 1-No. 5 Becker-Brainard Plain.
- 1-No. 4 Becker-Brainard.
- 2-No. 3-26" B. & S. Gear Cutters.
- 3-No. 3-36" B. & S. Gear Cutters.

PLANERS.

- 1-24"x 24"x 6' Hamilton.
- 1-30"x 30"x 8' Ohio.
- 1-30"x 30"x 10' Gray.
- 1-36"x 36"x 10' Whitcomb, 2 heads.
- 1-36"x 36"x 10' Cincinnati, 2 heads.
- 1-36"x 36"x 13' Sellers Spiral, 2 hds.
- 1-36"x 36"x 17' Powell, 2 heads.
- 1-48"x 48"x 18' Sellers Spiral, 1 hd.
- 1-76"x 48"x 18' Woodward & Powell, 2 heads.

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Bennett Bargains

Planers

18-22-26-30-32-36-42-54-60' between housings; 1-2-3 and 4 heads.

Vertical Boring Mills

30", 36", 51", 76" and 10'.

Horizontal Boring Machines

21", 3", 4"; also 5" Barret type.

Radial Drills

24", 3', 5' and 6'—Plain and Universal.

Upright and Multiple Drills

12"-24"-36" and 42"; also 3 and 6 spindle.

Lathes

Various sizes from 16" to 92" swing, 6' to 32' beds.

Turrets

2x24", 20x6", also 20", 28" and 34".

Milling Machines

48x36x14' Ingersoll 4 heads; 20"x7' Brainerd.

36' Shaper; 54' Slotter.

**Also Punches and Shears, Gear Cutters, Grinders,
Hammers, Presses, Cranes, Bolt and Pipe Machines**

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Machine Tool Makers

should investigate carefully the facilities offered by **Hitchcock's Machine Tool List** for reaching this trade in all parts of the country. Its circulation is specialized to completely cover *every line of manufacture* in which machine tools are used—as well as all railroad and other tool-using shops—with a thoroughness and effectiveness not equalled by any other advertising medium.

Good Used Tools

We offer the following used machine tools. Further particulars gladly given on receipt of request. We have facilities for overhauling used machinery and aim to offer only trustworthy machines.

BORING MACHINES.

- 60" Bullard vertical boring mill, 2 swivel heads, plain cone drive.
- 8' Betts vertical boring mill, 2 swivel heads, one friction head, motor drive.
- No. 2 Rochester, table type, belt driven.
- No. 2 Beaman & Smith, 4" dia. spindle, 6 1/2 h. p. Reliance motor, 2 h. p. head elevating motor.

DRILLING MACHINES.

- No. 1-1 spindle Avev, bench (24).
- No. 1-1 spindle Avev, column.
- 2-sp. Taylor & Fenn manufacturing.
- 3-sp. Taylor & Fenn manufacturing.
- 4-sp. Sigourney.
- 4-sp. Henry & Wright BB.
- 7-sp. Henry & Wright BB.
- No. D1 Colburn heavy duty reg. (6).
- 23" Mechanics stat. hd., w. & l., p. f.
- 24" Mechanics sliding hd., b. g., p. f.
- 26" Barnes sliding hd., b. g., p. f., (3).
- No. 13, 6-sp. P. & W., 21x9 head.
- No. 12, 12-sp. P. & W.
- 6-sp. Hendey, power fd. to each spdl.

GRINDERS.

- No. 4 12x60 Landis universal.
- 6x48 Pratt & Whitney plain.
- No. 2 B. & S. universal.
- No. 2 Oakley univ. cutter and tool.
- No. 11 Rivett, oscillating.
- No. 6 Bryant internal.
- No. 24 Van Norman internal with water att., (2).
- No. 70 Heald internal.
- No. 16 Blanchard vertical surface, direct motor drive.
- No. 3 Walker surface, magnetic ck.
- No. 5 Rivett hand feed oscillating.
- Garrigus rotary surface (14).
- 20" Diamond disc, right and left hand tables.
- Pratt & Whitney vertical surface, 36" mag. and new rotary chucks.
- No. 1 Hartford auto. surface.
- 20" Besly disc, right and left hand tables.
- 20" Taylor & Fenn wet tool with new wheels, (10).

LATHES.

- 9x12 Porter Cable, with taper and facing attachment.
- 14"x6' Prentice Bros., with chuck.
- 14"x6' Lodge & Shipley, c. r., p. c. f. oil pan and pump, (6).
- 14"x6' Porter, c. r., p. c. f., hol. sp.
- 16"x6' Hendey, geared head, c. r., p. c. f., hollow spdl., sgl. pulley.
- 18"x8' Prentice Bros., geared head, sgl. pulley, q. c., chuck fitted.
- 20"x12' Lodge & Shipley, patent hd.
- 44"x16' Niles, single back geared, 4" raising blocks.
- 30"x10' Gleason, plain rest, p. c. f.
- 26"x12' Putnam, c. r., d. b. g.
- 56"x24' Wood & Light, b. g., c. r., p. c. f.

MILLING MACHINES.

- No. 3 Fox plain, p. f.
- No. 1 Dow plain, b. g.
- No. 2 1/2 Fox plain, p. f.
- 12" Cincinnati plain mfg., (11).
- No. 2 Owen plain, new 3C Cinn. vise.
- No. 2 Kempsmith univ., b. g.
- No. 3 Becker vert., belt drive.
- No. 2 Cinn. vert., cone drive.
- No. 7 HS Becker, Lincoln, (3).
- No. 1 1/2 Cinn. pl., new 2C vises, (2).

SCREW MACHINES.

- No. 0 Foster wire feed.
- No. 2 Foster wire feed, (3).
- No. 1 P. & W. wire feed.
- 20" J. & L. geared head monitor.
- 2x24 J. & L. flat turret.
- No. 3 Acme grd. hd. flat turret, bar and chucking equip., taper.
- 2" Cleveland automatics, (5).
- 4 1/2" Cleveland automatics, (2).
- Fay auto. lathe.

MISCELLANEOUS.

- Broaching mach., No. 4 Lapointe.
- Die slotter, Garvin, with rotary table and micrometer.
- Planer, 24x24x6 Flather.
- Planer, 24x24x6 Putnam.
- Planer, 30x30x8 Woodward & P.
- Shaper, 20" Hendey.
- Shaper, 24" Juengst, crank.

Henry Prentiss & Company

Incorporated

149 Broadway

New York

Guaranteed Rebuilt Machine Tools

24" x 24" x 6' G. A. Gray, 1 head.....	\$ 900.
33" x 33" x 10' Knecht, 4 heads.....	3000.
No. 1 Cleveland Horizontal Boring Mill, 2½" bar.....	3000.
30" x 10" x 19' Osterlein Universal Miller.....	1500.
No. 1½ Valley City Universal Miller.....	1000.
No. 0 Owen Plain Back Geared (New).....	500.
6" x 48" Pratt & Whitney Plain Grinder.....	850.
No. 1 Cinti Universal Cutter & Reamer Grinder.....	325.
21" x 8' LeBlond Heavy Duty Quick Change Lathe.....	1000.
24" x 8' Lodge & Shipley Quick Change Lathe.....	850.
25" x 10' LeBlond Hvy. Duty Quick Change Lathe.....	1500.
26" x 10' Bridgeford Quick Change Lathe.....	1250.
18" x 8' Milwaukee Semi Quick-Change Lathe.....	450.
16" x 8' Flather Loose Change Lathe.....	390.
15" x 8' Von Wyck Loose Change Lathe.....	385.
16" x 6' Lodge & Shipley Quick Change Lathe.....	450.

Broadway Machinery Co.

236-238 Broadway, Cincinnati, Ohio

We have for sale:

20

Gooley & Edlund Briggs Millers

Excellent condition with
arbor and countershaft

Table 24" long. Traverse 22".

Don't Delay

Wire, Write or Phone

J. L. Lucas & Son, Inc., No. 3 Fox St.,
Bridgeport, Conn.

Reliabuilt Machine Tools

IMMEDIATE SHIPMENT

- 1 62" COLBURN Vertical Boring Mill, two swivel hds.
- 1 42" BEMENT Vertical Boring Mill, two swivel heads.
- 1 42" NILES Vert. Bor. Mill, one turret, one swivel hd.
- 2 No. 0 GIDDINGS & LEWIS Horizontal Boring Mills.
- 2 24" BULLARD Vert. Boring Mills, Production type.
- 2 36" BULLARD New Era Type Vertical Boring Mills.
- 1 52" BULLARD Boring Mill, two swivel hds., gr. feed.
- 1 96" POND Vertical Boring Mill, two swivel heads.
- 1 102" BETTS Vertical Boring Mill, two swivel heads.
- 2 15' HORIZONTAL Boring Mills, floor type, 10" bar.
- 1 No. 3 CINCINNATI Universal Miller, complete.
- 1 No. 3-B OWEN Plain Miller, vertical attachment.
- 10 No. 2 CINCINNATI Universal and Plain Millers.
- 1 No. 4 CINCINNATI Plain Miller, complete.
- 2 6' PRENTICE Radials, single pulley drive.
- 1 6' POND Radial, motor drive, complete.
- 1 5' BAUSH Radial Drill, cone drive, complete.
- 1 4' 6" BICKFORD Radial, complete.
- 1 48"x48"x12' HAMILTON Planer, 2 hds., arr. for four.
- 1 96"x72"x25' SELLERS Planer, four heads, complete.
- 1 36"x36"x10' CINCINNATI Planer, 2 hds., complete.
- 1 NEW 42"x42"x12' OPENSIDE Planer, two heads.
- 9 2 1/4" GRIDLEY Four Spindle Automatics, complete.
- 1 No. 5 BROWN & SHARPE Universal Grinder.
- 2 22"-46"x8' PUTNAM Gap Lathes, complete.
- 1 55"x22 1/2" POND Triple Geared Lathe.
- 1 26"x10' LODGE & SHIPLEY Lathe, late type.
- 3 18"x 8' LODGE & SHIPLEY Lathes, late type.
- 20 20"x 8' AMERICAN High Duty Q. C. G. Lathes.
- 1 40"x24' FIFIELD Lathe, triple geared.
- 1 No. 30, 12 Spindle BAUSH Drill, complete.
- 1 6"x32" NORTON Grinder, complete.
- 1 18" DILL Slotter, complete.
- 2 BLANCHARD Grinders, complete.
- 2 No. 60 HEALD Grinders.
- 1 84" GOULD & EBERHARDT Gear Hobber.

Simmons Machine Co., Inc.
Albany, New York

1001 Singer Bldg., N. Y., 358 Ellicott Square, Buffalo

Grand Rapids Specials

Balancing machines, Rockford, bench, (6).
 Bolt cutter, 2" Acme.
 Boring mill, 34" vertical.
 Brake, No. 4 Chicago, hand.
 Compressor, 4½x5 Imperial, type 12, (2).
 Drill, 26" Sibley, sliding head.
 Drill, 10-spindle Grand Rapids multiple.
 Electric welder, No. 140 Toledo.
 Flexible shaft, No. 5 Plank.
 Furnace, No. 4 Hardinge.
 Grinder, disc, 53" Besly No. 19.
 Grinder, drill, No. 2½ Avey high speed.
 Grinder, drill, style B Yankee.

Grinder, universal, No. 2 Bath.
 Hack saw, No. 4 Monarch.
 Hammers, 100 lb. Little Giant, power, (2).
 Hammer, 350 lb. Little Giant, power.
 Lathes, 24"x8" South Bend, 36" gap, (4).
 Miller, No. 25 Becker plain.
 Miller, No. 37-B Chicago, small.
 Miller, No. 1-C Fox plain.
 Miller, No. 3 heavy, plain.
 Molding mch., portable, Arcade.
 Sand blast outfits, No. 6 Pangborn, (2).
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Complete list on application

McMullen Machinery Company

"Everything in shop Equipment"

Grand Rapids, Mich.

Consult This List When in Need of Used Equipment

We sell satisfaction with each machine

MILLING MACHINES.

Garvin No. 15 pl., b. g., arbors.
 Rockford No. 3 hand swivel vise, vertical attachment.

Cincinnati 18" back geared plain, standard equipment.

GRINDERS.

No. 1 Norton universal c. & r.
 No. 1 Norton plain, t. d. and disc grinding attachment.

Garvin No. 11 pl., equal to new.
 No. 14 B. & S. pl. cyl., 7"x48"
 Fraser universal, No. 1, 8"x20", convertible type.

LATHES.

Fay & Scott 16"—36"x8" Gap, 6-hole turret and chuck.
 Monarch 16"x12" eng. prac. new.

Perkins 22"x16", comp. rest.
 American 14"x6" taper attachment, draw-in-attachment.

DRILLING MACHINES.

Bickford, 5' full univ. radial, t.a.
 Allen 6 spdl. h. s., b. b. sensitive.

Fosdick 5' full universal radial.
 Allen 2 spindle b. b. sensitive.

MISCELLANEOUS.

Foster No. 2 hand screw machine, friction head.
 Cochrane-Bly No. 4-B cold saw cutting-off machine.
 Bliss No. 59 embossing press, 200 tons capacity.
 Beaudry 150 lb. power hammer "Champion Type".

LYND-FARQUHAR COMPANY, Quality Machine Tools
 BOSTON, MASS.

Normal Times—Normal Prices

Hammers

250 Ton Mesta Steam Hydraulic Quick Acting Forging Press

1500-lb. Bliss, board drop.

1500-lb. United Engineering Co., board drop.

800-lb. Merrill, board drop.

300-lb. Bradley, helve.

80-lb. Bradley, helve.

60-lb. Yeakley, pneumatic.

Punches and Shears

Betts Punch, 20" gap, capacity 1" thru 1".

Cleveland Punch, 15" gap, capacity 3/4" thru 3/4".

Henry Pels Coping Machine, armor plate, capacity 10" beam.

Bement Horizontal Punch, 60" gap, main gear 72"x7"; weight about 30,000 lbs.; capacity 1 1/2" thru 1 1/2".

Presses

No. 512 Bliss, 33 tons working pressure.

No. 540 Max Ams, geared, weight 6,000 lbs.

D4 Ferracut, roll f., wt. 6,000 lbs.

No. 1 Bliss, st. sided, geared, 14" str.

No. 6 Farrel st. sided, geared, 5" str.

Vertical Boring Mills

14' Standard, 2 swivel heads.

10' Hilles & Jones single head.

90" Pond, 2 swivel heads.

72" Bement, single head.

60" Niles-Bement-Pond, 2 swivel heads—heavy, latest.

38" Baush, 2 swivel heads.

38" Bullard, 2 swivel heads.

Milling Machines

No. 3 Hendey plain, geared feeds.

No. 2 Hendey plain.

No. 24 Garvin universal.

Hilles & J. vert. 24" rotary table.

Newton vertical, heavy duty, 36" cutter head.

Brainard slab miller, 76"x36"x12" housings adjustable to 54".

Radial Drills

6' Bickford semi-univ., sgl. pulley dr.

5 1/2' Niles, univ., box table, etc.

5' Baush, motor driven.

3 1/2' Gang, box table, etc.

Planers

60"x48"x20' Gleason, 3 heads.

48"x36"x10' Ohio, 2 heads.

42"x42"x12' Pond, 2 heads.

36"x36"x12' CINCINNATI, TWO HEADS, HEAVY TYPE.

30"x30"x14' Flather, 2 heads.

Lathes

52"x22' Woodlitt, triple geared, face plate drive, etc.

50"x16' Fifeild.

48"x20' Gleason.

42"x21' New Haven.

28"x12' Fay & Scott.

Five(5) Fay Automatic Lathes, 23" swing, 6' bed.

20"x 8' Lodge & Shipley, geared hd.

16"x8' Reed Prentice, new, latest type

Slotters

30" Bullard draw cut.

Ames Combination Drill and Slotter, drills 54", slots 20".

10" New Haven, circular table.

Morton Portable, 6' stroke, 12" travel of head on base.

Grinders

No. 5 Bath Duplex complete, good as new.

No. 24 Bath Universal, complete.

Hammitt vertical, internal and external, complete.

No. 3 Brown & Sharpe, surface table 14"x80".

Two (2) No. 50 Gardner Disc Grinders, good as new.

NOTE—We have over 500 MACHINES to select from, all at our warehouse ready for immediate delivery, condition guaranteed.

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"New York's Greatest Clearing House—J. J. McCabe Lathe & Machinery Corporation"

**2 Sets of
10-ft.
Bending Rolls—**

10-ft. 2-in. between Housings.
Top Roll 9½-in. diam.
Lower Rolls 8¼-in. diam.
Weight 17,000 lbs.
End Housing hinged so as to readily
remove plate bent to a full circle.

**"LUCAS"
PRECISION**

**Boring, Drilling and
Milling Machines**

One—3-inch Bar, Single Pulley Drive,
extra Circular Table.
One—3" Bar, Cone-Dr., extra Bor. Bars.
Both—A-1 Condition, little used.

**24-inch Stroke
SLOTTERS**
of the first grade

"Bement-Miles & Co's", built last year
—Heavy Standard Machines with Ta-
ble having all the Automatic Feeds—
complete with Electro-Dynamic Co.'s
Motors—absolutely good as ever.

Many big shops are amazed when we show them such

Huge Stocks—New and Used Tools
all of which we actually own

**LATHES (Both New
and Used)**

36"x20' 3-step cone, dbl. b. g., qk. change.
38"x18' 3-step cone, dbl. b. g., qk. change.
36"x16' 3-step cone, dbl. b. g., qk. change.
30"x20' 3-step cone, dbl. b. g., qk. change.
30"x18' 3-step cone, dbl. b. g., qk. change.
30"x16' 3-step cone, dbl. b. g., qk. change.
30"x14' 3-step cone, dbl. b. g., qk. change.
30"x14' triple geared, face plate drive.
29"x20' 3-step cone, dbl. b. g., qk. change.
29"x18' 3-step cone, dbl. b. g., qk. change.
28"x30' 3-step cone, dbl. b. g., q. c., taper.
26"x16' 3-step cone, dbl. b. g., qk. change.

PLANERS

24"x24"x 6' one head, G. A. Gray Co.
24"x24"x 8' one head, Woodward & Powell.
27"x27"x 8' one head, Woodward & Powell.
30"x30"x 6' one head, Pond.
30"x30"x 6' one head, G. A. Gray Co.
48"x48"x12' four heads, Hamilton, motor drive.
48"x48"x16' three heads, New open side.

**MILLING
MACHINES**

No. 2 "Cincinnati" Plain (7 in stock).
No. 2 Milwaukee, Universal, with complete equipment.
No. 22 Brainerd Plain Table, 51"x14"
Newton Plan, Horizontal and vertical head, Table 60"x12".
Planer type Miller, 52"x48"x16", four heads.

SHAPERS

7-12" stroke, Plain, Automatic vertical-feed to table.
6-14" stroke, Plain, Automatic vertical-feed to table.
3-16" stroke, Plain, Automatic vertical-feed to table.
5-16" stroke, Back-geared Automatic vertical-feed to table-sud.
4-20" stroke, Back-geared Automatic vertical-feed to table-sud.

Partial List Fully Guaranteed Bargains

Give us your requirements

- 30—No. 4 W. & S. Screw Machines, g. f. h., power feed to turret.
 4—No. 6 W. & S. Screw Machines, g. f. h., power feed to turret.
 2—No. 3 A W. & S. Hollow Hexagon Turret Lathes (one new).
 1—Chain Block Triple $\frac{1}{2}$ ton (Vale & Towne).
 1—No. 2 Wells Bros. Rod & Bolt Cutter.

Boring Mills

- | | |
|-------------------------------|---------------------------|
| 1—6' Niles. | 1—No. 3 Universal. |
| 1—No. 1 Cleveland Horizontal. | 1—42" Gisholt. |
| 1—Foote-Burt Horizontal. | 1—No. 0 Giddings & Lewis. |

Drilling Machines

- | | |
|---------------------------------|-----------------------------|
| 1—D-8 Colburn Drill. | 2—2 Spindle Henry & Wright, |
| 1—3' American Radial. | ball bearing. |
| 1—3' Morris Radial | 1—16" Hoefler Drill Press. |
| 1—No. 0 Giddings & Lewis, b. b. | 1—24" Barnes All-G. H. |

Milling Machines

- | | |
|---------------------------|------------------|
| 1—No. 3 Davis rapid. | 1—No. 25 Becker. |
| 1—No. 3 Cincinnati plain. | |

M. J. Walsh Mchy. Co., 141 Sycamore St.,
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Machine Tools Immediately Available

- One Kempsmith No. 3 Universal Miller, new.
 One Kempsmith No. 3 Plain Miller, new.
 One Chandler Planer 36"x12', two heads, used.
 One Reed-Prentice 4' speed box Radial Drill, used.
 One No. 4-B Becker Vertical Miller, used.
 One No. 5 Universal Becker Vertical Miller, used.
 One Pratt & Whitney 2"x26" Turret Lathe.
 One Bath Universal Grinder No. 2, 10"x24".
 One Fraser Universal Grinder, with complete equip., practically new.
 One Flather 42x48x14' Planer, with two rail heads, one side head.
 One Bullard Vertical Boring and Turning Mill, 78" swing, two heads.
 One Reed Lathe, 24" swing, 20' bed, with compound rest.

Factory & Mill Supply Co.

137 Oliver St., Boston, Mass.

In Stock—Immediate Shipment

NEW MACHINES

Air Compressors.
Curtis, Gardner, and Ingersoll—All sizes..... Application.

Blocks, Chain.
All sizes..... Application.

Drilling Machines.
3—14" U. S. sensitive.....\$ 55.
2—14" Champion..... 90.
5—No. 60 Champion bench..... 32.
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1—No. 32 D DeMooy 2 spindle 400.
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Grinders.
1—Saphill Grinder.....\$ 95.
1—Garvin surface..... 115.
1—No. 1 Webster & Perks..... 1675.
1—Premier univ. tool & cutter 540.
1—No. 3 Modern universal..... 1800.
1—No. 1 Universal c. & r..... 550.
2—No. 5 Diamond Grinders..... 100.

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1—No. 1 Racine Power.....\$ 150.
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Lathes.
10—Speed Lathes with chucks for Fountain Pen Mfr.....\$ 90.
4—14"x6' Filsmith, qk. change 616.
1—18" Oliver Extra Heavy Duty Engine Lathe..... 1425.
4—15"x8' Sebastian Gap..... 550.
1—14" Pierce Heavy Pattern Turret Lathe..... 425.
1—14"x6' Mulliner-Enlund, ts. and draw-in attachment..... 1215.
2—12"x5' as above..... 1150.

Millers.
2—No. 1 Bickford.....\$ 350.
1—No. 1 $\frac{1}{2}$ American..... 1000.
1—No. 3 plain Kemsmith..... 1950.
1—Pratt & Wright Simplex..... 200.

Shapers.
1—16" Walcott, cone drive.....\$ 750.
1—20" Queen City..... 1200.
1—24" Queen City..... 1500.

Screw Machines.
3—No. 3 Federal 1-5/16" complete.....\$ 600.

USED MACHINERY

Drilling Machines.
1—4' Bickford radial.....\$ 650.
1—5' Bickford radial..... 1500.
1—4 spindle Garvin, old style..... 50.
1—6 spindle Garvin, old style..... 60.
1—18" Barnes back geared..... 75.
1—48" Davis & Cogil..... 500.
1—28" Bickford..... 250.
1—28" Barnes..... 300.
1—12" No. 5 Rockford..... 50.
1—12 spindle Baush..... 1800.
1—4' Cincinnati radial..... 750.
1—4' Mche. Tool Wks., radial 500.
1—42" Mche. Tool Wks., radial 500.
1—36" Radial..... 300.

Millers.
1—36" Ingersoll.....\$1450.
1—No. 2 Cincinnati, plain..... 950.
1—No. 3 Cincinnati, plain..... 1050.
1—No. 3 Becker, plain..... 1050.
1—No. 1 Lincoln, plain..... 500.

Boilers.
27—Boilers, all sizes and types..... Application.

Lathes.
1—No. 2 Niles double axle.....\$ 750.
1—38"x20' New Haven..... 1500.
1—32"x16' New Haven..... 1200.
1—24"x10' New Haven..... 650.
1—18"x 6' Lodge & Davis..... 350.
1—18"x 8' Blaisdell..... 200.
1—52" Niles tire lathe..... 4000.

Screw Machines.
3—No. 1 Foster, wire feed.....\$ 350.
2—No. 2 Foster, wire feed..... 400.
3—No. 4 Foster..... 600.
2—No. 5 Foster..... 600.
15—No. 5 Foster, wire feed..... 650.
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1—4" Cleveland Automatic..... 400.
1—2" Cleveland Automatic..... 425.



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Alert Tool Co., Philadelphia

Arbors, Solid

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Schipper Machine & Tool Co., Aurora, Ind.
Simmons Machine Co., Albany, N. Y.

Boring Heads

Kelly Reamer Co., Cleveland
Waterston, J. M., Detroit, Mich.

Boring Machines, Cylinder

Barrett Mch. Tool Co., Meadville, Pa.

Boring Machines, Horizontal

Cincinnati Pulley Machinery Co., Cincinnati
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Rockford Drilling Machine Co., Rockford, Ill.

Boring and Turning Machines, Vertical

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Simmons Machine Co., Albany, N. Y.
Turner Machine Co., Danbury, Conn.

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Gwilliam Co., 253 W. 58th St., New York

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Newman Mfg. Co., Cincinnati

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Peter Bros. Mfg. Co., Algonquin, Ill.
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Dalton Mfg. Corp., 1911 Park Ave., N. Y.
Hoggson & Pettis Mfg. Co., New Haven, Conn.
Newman Mfg. Co., Cincinnati
Sidney Tool Co., Sidney, Ohio
Simmons Machine Co., Albany, N. Y.
Thomas Elevator Co., 31 S. Hoyne Ave., Chicago

Classified Finding Index

Chucks, Magnetic
Dalton Mfg. Corp., 1911 Park Ave., N. Y.
Heald Machine Co., Worcester, Mass.

Chucks, Wrenchless
Thomas Elevator Co., 31 S. Hoyne Ave.
Chicago

Clutches—Friction
Carroll Mfg. Co., L. W., Batavia, Ohio
Conway & Co., Cincinnati
Edgemont Machine Co., Dayton, Ohio
Milwaukee Shaper Co., Milwaukee, Wis.
National Clutch Co., 1859 Fulton St., Chicago

Cold Saws
Burke Machine Tool Co., Conneaut, Ohio
Cochrane-Bly Co., Rochester, N. Y.
Greenfield Tap & Die Corp., Greenfield, Mass.
Peter Bros. Mfg. Co., Algonquin, Ill.

Contract Work Wanted
Bonney Vise & Tool Works, Allentown, Pa.
Geuder, Paeschke & Frey Co., Milwaukee, Wis.
Mauch Chunk Iron Works, Mauch Chunk, Pa.
New Britain Machine Co., New Britain, Conn.
Robbins, Gamwell & Co., Pittsfield, Mass.
Steber Machine Co., Utica, N. Y.

Couplings, Friction Clutch
Conway & Co., Cincinnati

Cranes, Hand Power
Euclid Crane & Hoist Co., Euclid, Ohio
Fawling & Harnischfeger Co., Milwaukee, Wis.
Weaver Mfg. Co., Springfield, Ill.

Cranes, Portable
Canedy-Otto Mfg. Co., Chicago Heights, Ill.
Canton Foundry & Mch. Co., Canton, Ohio
Weaver Mfg. Co., Springfield, Ill.

Cranes, Traveling
Euclid Crane & Hoist Co., Euclid, Ohio
Fawling & Harnischfeger Co., Milwaukee, Wis.

Crank Pin Turning Machine
Pedrick Tool & Machine Co., Philadelphia
Underwood Corp., H. B., Philadelphia

Crank, Ball
Cincinnati Ball Crank Co., Cincinnati

Cutters, Adjustable
Becker Milling Machine Co., Boston, Mass.
McCroskey Tool Corporation, Meadville, Pa.
Madison Mfg. Co., Muskegon, Mich.

Cutters, Bolt
Lewthwaite Co., Geo. A., 116 Walker St., N. Y.

Cutters, Keyseating
Racine Tool & Machine Co., Racine, Wis.
Whitney Mfg. Co., Hartford, Conn.

Cutters, Milling
Becker Milling Machine Co., Boston, Mass.
Brown & Sharpe Mfg. Co., Providence, R. I.
Clough, R. M., Meriden, Conn.
Genesee Mfg. Co., Rochester, N. Y.
Michigan Tool Co., Detroit, Mich.
Racine Tool & Machine Co., Racine, Wis.
Whitney Mfg. Co., Hartford, Conn.

Cutting-Off Machines
Davis Machine Tool Co., Rochester, N. Y.
Etna Mfg. Co., Toledo, Ohio
Peter Bros. Mfg. Co., Algonquin, Ill.
Wood Turret Machine Co., Brazil, Ind.

Cylinder Boring Machines, Portable
Pedrick Tool & Machine Co., Philadelphia
Stow Flexible Shaft Co., Philadelphia
Underwood Corp., H. B., Philadelphia

Cylinder or Dome Facing Machines
Underwood Corp., H. B., Philadelphia

Dials, Graduated
Wiggins & Co., A. V., Syracuse, N. Y.

Die Heads, Self-Opening
Modern Tool Co., Erie, Pa.
Murchey Machine & Tool Co., Detroit, Mich.
National Acme Company, Cleveland

Diesing Machines
Henry & Wright Mfg. Co., Hartford, Conn.

Dies, Pipe Threading
Bignall & Keeler Mch. Wks., Edwardsville, Ill.
Greenfield Tap & Die Corp., Greenfield, Mass.

Dies, Screw and Thread Cutting
Greenfield Tap & Die Corp., Greenfield, Mass.
Hardinge Brothers, 1770 Bersteau Av., Chicago
National Acme Co., Cleveland

Dies, Self-Opening Adjustable
Greenfield Tap & Die Corp., Greenfield, Mass.
Modern Tool Co., Erie, Pa.
Murchey Mch. & Tool Co., Detroit, Mich.
Rickert-Shafer Co., Erie, Pa.

Dogs, Machine
Ready Tool Co., Bridgeport, Conn.

Drilling Machine Heads
Nelson Blanck Mfg. Co., Detroit, Mich.
Newman Mfg. Co., Cincinnati
Rockford Drilling Machine Co., Rockford, Ill.
Sells Machine Tool Co., Pawtucket, R. I.
Spafford Tool Works, Hartford, Conn.
United States Machine Tool Co., Cincinnati

Drilling Machines, Bench
Burke Machine Tool Co., Conneaut, Ohio
Canedy-Otto Mfg. Co., Chicago Heights, Ill.
Cincinnati Pulley Machinery Co., Cincinnati
Demco Machine Tool Co., Cleveland
High Speed Hammer Co., Rochester, N. Y.
Reed Co., Francis, Worcester, Mass.
Rockford Drilling Mch. Co., Rockford, Ill.
Taylor & Fenn Co., Hartford, Conn.

Drilling Machines, Hand
United States Machine Tool Co., Cincinnati

Drilling Machines, Horizontal
Fawling & Harnischfeger Co., Milwaukee, Wis.
Rockford Drilling Mch. Co., Rockford, Ill.

Drilling Machines, Multiple Spindle
Cincinnati Pulley Machinery Co., Cincinnati
Demco Machine Tool Co., Cleveland, Ohio
Edlund Machinery Co., Inc., Cortland, N. Y.
Henry & Wright Mfg. Co., Hartford, Conn.
National Acme Co., Cleveland
Reed Co., Francis, Worcester, Mass.
Rockford Drilling Mch. Co., Rockford, Ill.
Sipp Machine Co., Paterson, N. J.
Taylor & Fenn Co., Hartford, Conn.

Drilling Machines, Portable Electric
Independent Pneumatic Tool Co., 600 W.
Jackson Blvd., Chicago
Stow Flexible Shaft Co., Philadelphia
Van Dorn Electric Tool Co., Cleveland
Wisconsin Electric Co., Racine, Wis.

Drilling Machines, Post
Canedy-Otto Mfg. Co., Chicago Heights, Ill.
Hammond Mfg. Co., Cleveland, Ohio
Henry & Wright Mfg. Co., Hartford, Conn.
Mueller Machine Tool Co., Cincinnati
Silver Mfg. Co., Salem, Ohio

Drilling Machines, Radial
Canedy-Otto Mfg. Co., Chicago Heights, Ill.
Hammond Mfg. Co., Cleveland
Henry & Wright Mfg. Co., Hartford, Conn.
Mueller Machine Tool Co., Cincinnati
Fawling & Harnischfeger Co., Milwaukee, Wis.
Silver Mfg. Co., Salem, Ohio
Taylor & Fenn Co., Hartford, Conn.
Sipp Machine Co., Paterson, N. J.
Wickes Bros., Saginaw, Mich.

Drilling Machines, Sensitive
Burke Machin. Tool Co., Conneaut, Ohio
Canedy-Otto Mfg. Co., Chicago Heights, Ill.
Cincinnati Pulley Machinery Co., Cincinnati
Demco Machine Tool Co., Cleveland
Edlund Machinery Co., Inc., Cortland, N. Y.
Fenn Mfg. Co., Hartford, Conn.
Hardinge Brothers, 1770 Bersteau Av., Chicago
Henry & Wright Mfg. Co., Hartford, Conn.
Reed Co., Francis, Worcester, Mass.
Sipp Machine Co., Paterson, N. J.
Taylor & Fenn Co., Hartford, Conn.
United States Machine Tool Co., Cincinnati
Wisconsin Electric Co., Racine, Wis.

Classified Finding Index

Drilling, Milling and Boring Machines, Vertical
Aurora Tool Works, Aurora, Ind.
Knight Machinery Co., W. B., St. Louis, Mo.

Drilling Machines, Vertical
Aurora Tool Works, Aurora, Ind.
Canedy-Otto Mfg. Co., Chicago Heights, Ill.
Cincinnati Pulley Machinery Co., Cincinnati
Davis Machine Tool Co., Rochester, N. Y.
Henry & Wright Mfg. Co., Hartford, Conn.
Hinkley Machine Works, Hinkley, Ill.
Minster Machine Co., Minster, Ohio
Rockford Drilling Machine Co., Rockford, Ill.
Silver Mfg. Co., Salem, Ohio
Sipp Machine Co., Paterson, N. J.
Taylor & Fenn Co., Hartford, Conn.

Drilling and Tapping Attachments
Aurora Tool Works, Aurora, Ind.
Demco Machine Tool Co., Cleveland
Henry & Wright Mfg. Co., Hartford, Conn.
McCroskey Tool Corporation, Meadville, Pa.
Modern Tool Co., Erie, Pa.
Newman Mfg. Co., Cincinnati
Reed Co., Francis, Worcester, Mass.
Schipper Machine & Tool Co., Aurora, Ind.
Sipp Machine Co., Paterson, N. J.
Turner Machine Co., Danbury, Conn.

Drills, Pneumatic
Independent Pneumatic Tool Co., 600 W.
Jackson Blvd., Chicago

Dust Handling Equipment
Knickerbocker Co., Jackson, Mich.

Emery Stands
Blount Co., J. G., Everett, Mass.
Buchanan Co., Thos., Cincinnati
Carroll Mfg. Co., L. W., Batavia, Ohio
Marschke Mfg. Co., Indianapolis, Ind.
Partridge, E. O., 2047 W. Lake St., Chicago

Emery Wheel Dressers and Cutters
Buchanan Co., Thos., Cincinnati
Cleveland Flue Cleaner Mfg. Co., Cleveland
Taylor & Fenn Co., Hartford, Conn.

Feed Gear, for Turret Lathes
Wiggins & Co., A. V., Syracuse, N. Y.

Feeders, Oil and Soda Water
New Britain Machine Co., New Britain, Conn.

Filing Machines, Die
Cochrane-Hily Co., Rochester, N. Y.

Flexible Shafts
Stow Flexible Shaft Co., Philadelphia, Pa.

Forges
Canedy-Otto Mfg. Co., Chicago Heights, Ill.

Furnaces
Bennett Co., W. R., Elmwood, Conn.

Furniture, Machine Shop
New Britain Machine Co., New Britain, Conn.

Gauges, Amplifying, Snap and Plug
North Side Tool Co., Dayton, Ohio

Gauges, Taper
Hartford Special Mch. Co., Hartford, Conn.
Way Co., A. F., Hartford, Conn.

Gauging Machines
Davie Tool Co., Cleveland, Ohio
North Side Tool Co., Dayton, Ohio

Gear Cutting Machines
Brown & Sharpe Mfg. Co., Providence, R. I.

Grinding Machines, Bench
Blount Co., J. G., Everett, Mass.
Carroll Mfg. Co., L. W., Batavia, Ohio
Partridge, E. O., 2047 W. Lake St., Chicago
Webster & Perks Tool Co., Springfield, Ohio

Grinding Machines, Cutter, Reamer and Tool
Blount Co., J. G., Everett, Mass.
Clough, R. M., Meriden, Conn.
Grand Rapids Grinding Machine Co., Grand Rapids, Mich.
Greenfield Machine Co., Greenfield, Mass.

Greenfield Tap & Die Corp., Greenfield, Mass.
McDonough Mfg. Co., Eau Claire, Wis.
Manhattan Machine & Tool Works, Grand Rapids, Mich.
Marschke Mfg. Co., Indianapolis, Ind.
Modern Tool Co., Erie, Pa.
National Acme Co., Cleveland
National Machine Tool Co., Racine, Wis.
Simmons Machine Co., Albany, N. Y.
Thompson Grinder Co., Springfield, Ohio
Wilmarth & Norman Co., Grand Rapids, Mich.

Grinding Machines, Cylindrical
Heald Machine Co., Worcester, Mass.
Whitney & Son, Baxter D., Winchendon, Mass.

Grinding Machines, Cylindrical
Brown & Sharpe Mfg. Co., Providence, R. I.
Greenfield Machine Co., Greenfield, Mass.
McDonough Mfg. Co., Eau Claire, Wis.
Manhattan Machine & Tool Works, Grand Rapids, Mich.
Modern Tool Co., Erie, Pa.
Ott Grinder Co., Indianapolis, Ind.
Schmidt Co., B. L., Davenport, Iowa
Simmons Machine Co., Albany, N. Y.
Thompson Grinder Co., Springfield, Ohio
Webster & Perks Tool Co., Springfield, Ohio

Grinding Machines, Die
Abrasive Mch. Tool Co., E. Providence, R. I.
Manhattan Machine & Tool Works, Grand Rapids, Mich.

Grinding Machines, Disc
Badger Tool Co., Beloit, Wis.
Sellew Machine Tool Co., Pawtucket, R. I.

Grinding Machines, Drill
Grand Rapids Grinding Machine Co., Grand Rapids, Mich.
La Salle Tool Co., La Salle, Ill.
Wilmarth & Norman Co., Grand Rapids, Mich.

Grinding Machines, Face
Marschke Mfg. Co., Indianapolis, Ind.
Taylor & Fenn Co., Hartford, Conn.
Thompson Grinder Co., Springfield, Ohio

Grinding Machines, Cage
Abrasive Mch. Tool Co., E. Providence, R. I.

Grinding Machines, Internal
Dalton Mfg. Corp., 1911 Park Av., New York
Heald Machine Co., Worcester, Mass.
Modern Tool Co., Erie, Pa.
National Machine Tool Co., Racine, Wis.
Ott Grinder Co., Indianapolis, Ind.
Taylor & Fenn Co., Hartford, Conn.
Thompson Grinder Co., Springfield, Ohio
Whitney & Son, Baxter D., Winchendon, Mass.
Wilmarth & Norman Co., Grand Rapids, Mich.

Grinding Machines, Portable
Independent Pneumatic Tool Co., 600 W.
Jackson Blvd., Chicago
Marschke Mfg. Co., Indianapolis, Ind.
National Machine Tool Co., Racine, Wis.
Stow Flexible Shaft Co., Philadelphia
Strand & Co., N. A., 685 W. Jackson Blvd., Chicago
Van Dorn Electric Tool Co., Cleveland
Wisconsin Electric Co., Racine, Wis.

Grinding Machines, Saagging
Grand Rapids Grinding Machine Co., Grand Rapids, Mich.
Manhattan Machine & Tool Works, Grand Rapids, Mich.
Marschke Mfg. Co., Indianapolis, Ind.

Grinding Machines, Surface
Abrasive Mch. Tool Co., E. Providence, R. I.
Bristol Machine Tool Co., Bristol, Conn.
Heald Machine Co., Worcester, Mass.
La Salle Tool Co., La Salle, Ill.
Reid Brothers Co., Inc., Beverly, Mass.
Thompson Grinder Co., Springfield, Ohio
Wilmarth & Norman Co., Grand Rapids, Mich.

Classified Finding Index

Grinding Machines, Universal

Brown & Sharpe Mfg. Co., Providence, R. I.
Grand Rapids Grinding Machine Co., Grand Rapids, Mich.
Greenfield Machine Co., Greenfield, Mass.
Greenfield Tap & Die Corp., Greenfield, Mass.
McDonough Mfg. Co., Eau Claire, Wis.
Modern Tool Co., Erie, Pa.
Ott Grinder Co., Indianapolis, Ind.
Simmons Machine Co., Albany, N. Y.
Thompson Grinder Co., Springfield, Ohio
Webster & Perks Tool Co., Springfield, Ohio
Wilmarth & Morman Co., Grand Rapids, Mich.

Hack Saw Blades

Racine Tool & Machine Co., Racine, Wis.

Hack Saw Machines

Armstrong-Blum Mfg. Co., 341 N. Francisco Av., Chicago
Peerless Machine Co., Racine, Wis.
Racine Tool & Machine Co., Racine, Wis.

Hammers, Bolt and Motor Driven

Harr H. Edall, Erie, Pa.
Beaudry & Co., Boston, Mass.
High Speed Hammer Co., Rochester, N. Y.
Quickwork Co., St. Marys, Ohio
United Hammer Co., Boston, Mass.

Hammers, Riveting

High Speed Hammer Co., Rochester, N. Y.

Handles, Machine

Cincinnati Ball Crank Co., Cincinnati

Heads, Dividing

Dickow, Fred C., 1868 W. Lake St., Chicago
Simmons Machine Co., Albany, N. Y.
Steptoe Co., John, Cincinnati
Willard Press & Tool Co., Cincinnati

Hobbs

Michigan Tool Co., Detroit, Mich.

Hoists, Air

Independent Pneumatic Tool Co., 699 W. Jackson Blvd., Chicago

Hoists, Electric

Eucild Crane & Hoist Co., Euclid, Ohio
Thomas Elevator Co., 31 S. Hoyne Ave., Chicago
Weaver Mfg. Co., Springfield, Ill.

Hoists, Electric Traveling

Eucild Crane & Hoist Co., Euclid, Ohio
Pawling & Harnischfeger Co., Milwaukee, Wis.

Hoists, Portable

Canton Foundry & Machine Co., Canton, Ohio

Jigs, Fixtures, Tools, Etc.

Craftsman Tool Co., Conneaut, Ohio
Hartford Special Mch. Co., Hartford, Conn.
Hinckley Machine Works, Hinckley, Ill.
Lee Co., Frank H., Danbury, Conn.
Nestor Mfg. Co., 48 W. 13th St., New York
North Side Tool Co., Dayton, Ohio
Snafford Tool Works, Hartford, Conn.
Way Co., A. F., Hartford, Conn.
Whiting & Comstock, Hartford, Conn.
Wiggins & Co., A. V., Syracuse, N. Y.

Joints, Universal

Ainslie Mch. & Tool Works, Hartford, Conn.

Keyseating Machines

Chattanooga Mch. Co., Chattanooga, Tenn.
Davis Machine Tool Co., Rochester, N. Y.
Lapointe Co., J. N., New London, Conn.
National Machine Tool Co., Cincinnati
Racine Tool & Machine Co., Racine, Wis.
Whitney Mfg. Co., Hartford, Conn.

Kauri Holder

Austin Tool & Machine Co., Inc., Pittsburgh

Lathe Accessories and Attachments

Dalton Mfg. Corp., 1911 Park Av., New York
Greaves-Klusman Tool Co., Cincinnati
McCroskey Tool Corporation, Meadville, Pa.
Modern Tool Co., Erie, Pa.
Sidney Tool Co., Sidney, Ohio
Simmons Machine Co., Albany, N. Y.
South Bend Lathe Works, South Bend, Ind.

Lathes, Bench

Blount Co., J. G., Everett, Mass.
Dalton Mfg. Corp., 1911 Park Av., New York
Greenfield Tap & Die Corp., Greenfield, Mass.
Hardinge Brothers, 1770 Berteau Av., Chicago
South Bend Lathe Works, South Bend, Ind.

Lathes, Engine

Boye & Emmes Machine Tool Co., Cincinnati
Canedy-Otto Mfg. Co., Chicago Heights, Ill.
Chard Lathe Co., Newcastle, Ind.
Dalton Mfg. Corp., 1911 Park Av., New York
Davis Machine Tool Co., Rochester, N. Y.
Greaves-Klusman Tool Co., Cincinnati
Monarch Machine Tool Co., Sidney, Ohio
Mueller Machine Tool Co., Cincinnati
Sidney Tool Co., Sidney, Ohio
Smith Mfg. Co., Philip, Sidney, Ohio
South Bend Lathe Works, South Bend, Ind.
Willard Machine Tool Co., Cincinnati
Worcester Lathe Co., Worcester, Mass.
Wickes Bros., Saginaw, Mich.

Lathes, Flat Turret

Acme Machine Tool Co., Cincinnati

Lathes, Foot Power

Dalton Mfg. Corp., 1911 Park Av., New York

Lathes, Horizontal Turret

Acme Machine Tool Co., Cincinnati
Chard Lathe Co., Newcastle, Ind.
Davis Machine Tool Co., Rochester, N. Y.
Smurr & Kamen Co., 328 N. Albany Av., Chicago
Steinle Turret Machine Co., Madison, Wis.
Wood Turret Machine Co., Brazil, Ind.

Lathes, Short Cut

Adams Mfg. Co., O. R., Rochester, N. Y.
Sidney Tool Co., Sidney, Ohio

Lathes, Speed and Hand

Blount Co., J. G., Everett, Mass.
Greenfield Tap & Die Corp., Greenfield, Mass.

Lathes, Tilted Turret

Wood Turret Machine Co., Brazil, Ind.

Lockers, Shelving and Cupboards, Steel

Terrell's Equipment Co., Grand Rapids, Mich.

Mandrels, Expanding

Alert Tool Co., Philadelphia
Nicholson & Co., W. H., Wilkes-Barre, Pa.

Mandrels, Solid

Nicholson & Co., W. H., Wilkes-Barre, Pa.

Metal Cutting Machines, Sheet

Racine Tool & Machine Co., Racine, Wis.
Savage Co., W. J., Knoxville, Tenn.
Way Co., A. F., Hartford, Conn.

Milling Attachments

Brown & Sharpe Mfg. Co., Providence, R. I.
Burke Machine Tool Co., Conneaut, Ohio
Hinckley Machine Works, Hinckley, Ill.
Knight Machinery Co., W. B., St. Louis, Mo.
Steptoe Co., John, Cincinnati
Whiting & Comstock, Hartford, Conn.
Willard Press & Tool Co., Cincinnati

Milling Machines, Automatic

Becker Milling Machine Co., Boston, Mass.

Milling Machines, Bench

Rickett Machine & Mfg. Co., Cincinnati
Burke Machine Tool Co., Conneaut, Ohio
Carter & Hakes Mch. Co., W. Winsted, Conn.
Hardinge Brothers, 1770 Berteau Av., Chicago
Simmons Machine Co., Albany, N. Y.

Milling Machines, Hand

Bristol Machine Tool Co., Bristol, Conn.
Burke Machine Tool Co., Conneaut, Ohio
Carter & Hakes Mch. Co., W. Winsted, Conn.
Davenport Mfg. Co., Meadville, Pa.
Steptoe Co., John, Cincinnati
Whitney Mfg. Co., Hartford, Conn.

Milling Machines, Horizontal

Beaman & Smith Co., Providence, R. I.
Becker Milling Machine Co., Boston, Mass.
Gooley & Edlund, Cortland, N. Y.
Steptoe Co., John, Cincinnati

Classified Finding Index

Milling Machines, Plain

American Milling Machine Co., Cincinnati
Beaman & Smith Co., Providence, R. I.
Becker Milling Machine Co., Boston, Mass.
Bickett Machine & Mfg. Co., Cincinnati
Brown & Sharpe Mfg. Co., Providence, R. I.
Burke Machine Tool Co., Conneaut, Ohio
Cochrane-Bly Co., Rochester, N. Y.
Davenport Mfg. Co., Meadville, Pa.
Gooley & Edlund, Cortland, N. Y.
Stephens Co., John, Cincinnati

Milling Machines, Portable

Pedrick Tool & Machine Co., Philadelphia
Underwood Corp., H. B., Philadelphia

Milling Machines, Universal

American Milling Machine Co., Cincinnati
Becker Milling Machine Co., Boston, Mass.
Brown & Sharpe Mfg. Co., Providence, R. I.
Cochrane-Bly Co., Rochester, N. Y.
Stephens Co., John, Cincinnati

Milling Machines, Vertical

Beaman & Smith Co., Providence, R. I.
Becker Milling Machine Co., Boston, Mass.
Bickett Machine & Mfg. Co., Cincinnati
Bristol Machine Tool Co., Bristol, Conn.
Brown & Sharpe Mfg. Co., Providence, R. I.
Burke Machine Tool Co., Conneaut, Ohio
Clough, R. M., Meriden, Conn.
Cochrane-Bly Co., Rochester, N. Y.
Knight Machinery Co., W. B., St. Louis, Mo.
Taylor & Fenn Co., Hartford, Conn.

Mills, Adjustable Hollow

Genesee Mfg. Co., Rochester, N. Y.

Motors, Electric

Reliance Electric & Eng. Co., Cleveland
Wisconsin Electric Co., Racine, Wis.

Oil Cups

Gits Bros. Mfg. Co., 1940 S. Kilbourne Av., Chicago

Tucker, W. C. & F. C., Hartford, Conn.

Oil Hole Covers

Tucker, W. C. & F. C., Hartford, Conn.

Oils, Quenching

Bell & Gossett Co., 613 W. 30th St., Chicago

Parallels, Adjustable

Herlitz Mfg. Co., O. B., Hartford, Conn.

Pattern Shop Machinery

Chicago Mch. Exchange, 1219 Washington Blvd., Chicago

Cochrane-Bly Co., Rochester, N. Y.
Silver Mfg. Co., Salem, Ohio
Towley Mfg. Co., John T., Cincinnati

Pipe Bending Machines

Pedrick Tool & Machine Co., Philadelphia
Underwood Corp., H. B., Philadelphia

Pipe Cutting and Threading Machines

Rignall & Keeler Mch. Wks., Edwardsville, Ill.
Simmons Machine Co., Albany, N. Y.

Planer Attachment, Radius

Underwood Corp., H. B., Philadelphia

Planer Tools, Circular

Underwood Corp., H. B., Philadelphia

Planers, Valve Seat, Portable

Pedrick Tool & Machine Co., Philadelphia
Underwood Corp., H. B., Philadelphia

Planing Machines, Metal

Bickett Machine & Mfg. Co., Cincinnati
Cincinnati Planer Co., Cincinnati
Lee Co., Frank H., Danbury, Conn.

Pneumatic Tools

Independent Pneumatic Tool Co., 600 W. Jackson Blvd., Chicago

Polishing and Buffing Machines

Blount Co., J. G., Everett, Mass.
Canedy-Otto Mfg. Co., Chicago Heights, Ill.
New Britain Machine Co., New Britain, Conn.
Partridge, E. O., 2047 W. Lake St., Chicago
Stow Flexible Shaft Co., Philadelphia

Webster & Perka Tool Co., Springfield, Ohio
Wilmarth & Morman Co., Grand Rapids, Wis.
Wisconsin Electric Co., Racine, Wis. (Mich.)

Presses, Arbor

Atlas Press Co., Kalamazoo, Mich.
Bartlett, Edwin E., Nashua, N. H.
Canedy-Otto Mfg. Co., Chicago Heights, Ill.
Laurie Mfg. Co., Springfield, Ill.
Nicholson & Co., W. H., Wilkes-Barre, Pa.
Weaver Mfg. Co., Springfield, Ill.

Presses, Broaching

Atlas Press Co., Kalamazoo, Mich.
Bartlett, Edwin E., Nashua, N. H.
Laurie Mfg. Co., Springfield, Ill.

Presses, Foot

Atlas Press Co., Kalamazoo, Mich.
Lewthwaite Co., Geo. A., 116 Walker St., N. Y.
Laurie Mfg. Co., Springfield, Ill.
Rockford Iron Works, Rockford, Ill.
Taylor & Fenn Co., Hartford, Conn.
Partridge, E. O., 2047 W. Lake St., Chicago

Presses, Power

Loshbough-Jordan T. & M. Co., Elkhart, Ind.
Rockford Iron Works, Rockford, Ill.
Willard Press & Tool Co., Cincinnati

Presses, Punch

Enterprise Machinery Co., 32 S. Clinton St., Chicago
Henry & Wright Mfg. Co., Hartford, Conn.
Lewthwaite Co., Geo. A., 116 Walker St., N. Y.
Loshbough-Jordan T. & M. Co., Elkhart, Ind.
Laurie Mfg. Co., Springfield, Ill.
Partridge, E. O., 2047 W. Lake St., Chicago
Rockford Iron Works, Rockford, Ill.

Presses, Screw

Atlas Press Co., Kalamazoo, Mich.
Laurie Mfg. Co., Springfield, Ill.
Towley Mfg. Co., John T., Cincinnati
Weaver Mfg. Co., Springfield, Ill.

Pulley Machinery

Cincinnati Pulley Mch. Co., Cincinnati

Pulleys, Iron, Solid and Split

Conway & Co., Cincinnati
National Clutch Co., 1859 Fulton St., Chicago
Pyott Fdry. Co., 328 N. Sangamon St., Chicago

Punch Press Feeds

Rockford Iron Works, Rockford, Ill.

Punches, Hand

Armstrong-Blum Mfg. Co., 341 N. Francisco Av., Chicago
Hendley & Whittemore Co., Beloit, Wis.

Punches, Power

Clough, R. M., Meriden, Conn.
Hendley & Whittemore Co., Beloit, Wis.
Lewthwaite Co., Geo. A., 116 Walker St., N. Y.
Long & Allstatter Co., Hamilton, Ohio
Wickes Bros., Saginaw, Mich.

Punches and Dies

Hendley & Whittemore Co., Beloit, Wis.
Lewthwaite Co., Geo. A., 116 Walker St., N. Y.
Lewthwaite Mch. Co., T. H., 415 E. 31st St., New York

North Side Tool Co., Dayton, Ohio
Rockford Iron Works, Rockford, Ill.

Reamers, Solid

Clough, R. M., Meriden, Conn.
Kelly Reamer Co., Cleveland
McCrosky Tool Corporation, Meadville, Pa.
Ready Tool Co., Bridgeport, Conn.

Reamers, Adjustable

Clough, R. M., Meriden, Conn.
Greenfield Tap & Die Corp., Greenfield, Mass.
Kelly Reamer Co., Cleveland
McCrosky Tool Corporation, Meadville, Pa.

Reamers, Cylinder

Hinckley Machine Works, Hinckley, Ill.
Kelly Reamer Co., Cleveland
McCrosky Tool Corporation, Meadville, Pa.

Reels, Extension

Cincinnati Specialty Mfg. Co., Cincinnati

Classified Finding Index

Riveting Machines

Grant Mfg. & Mch. Co., Bridgeport, Conn.
High Speed Hammer Co., Rochester, N. Y.
Independent Pneumatic Tool Co., 800 W.
Jackson Blvd., Chicago

Rad Cutters

Armstrong-Blum Mfg. Co., 341 N. Francisco
Ave., Chicago
Hendley & Whittemore Co., Beloit, Wis.
Lewthwaite Co., Geo. A., 116 Walker St., N. Y.
Tucker, W. C. & F. C., Hartford, Conn.

Roller Bearings

Gwilliam Co., 253 W. 58th St., New York

Scraping Machines, Pneumatic

Anderson Brothers Mfg. Co., Rockford, Ill.

Screw Machines, Automatic

Brown & Sharpe Mfg. Co., Providence, R. I.
Cincinnati Automatic Mch. Co., Cincinnati
National Acme Company, Cleveland
New Britain Mch. Co., New Britain, Conn.

Screw Machines, Plain or Hand

Acme Machine Tool Co., Cincinnati
Smurr & Kamen Co., 328 N. Albany Av.,
Chicago
Wood Turret Machine Co., Brazil, Ind.

Screws, Cap and Set

National Acme Company, Cleveland

Second-Hand Machinery Dealers

Allen Mch. Co., B. C., 194 S. Clinton St.,
Chicago
Balfour-Packard Mch. Co., Milwaukee, Wis.
Baird Machinery Co., W. J., Detroit, Mich.
Bath & Co., Cyril J., Cleveland, Ohio
Bennett Machinery Co., G. L., 39 Church
St., New York

Biggs-Watterson Co., Cleveland
Broadway Machinery Co., Cincinnati
Brown-McDonald Mch. Co., St. Louis, Mo.
Brownell Machinery Co., Providence, R. I.
Cleveland Belting & Mch. Co., Cleveland
Dale-Brewster Mch. Co., 641 Washington
Blvd. Chicago

Enaley Machinery Co., E. L., 655 Washington
Blvd., Chicago

Factory & Mill Supply Co., 137 Oliver St.,
Boston, Mass.

Federal Mch. Sales Co., 12 N. Jefferson St.,
Chicago

Fitzgerald & Co., W. H. J., Boston, Mass.
Girard Machine & Tool Co., Philadelphia

Graves Mch. Exc. 50 Church St., New York
Harris Bros. Co., W. 35th & Iron, Chicago

Hill, Clarke & Co., 625 Wash. Y'n Bld., Chicago
Johnston Co., Wm. T., Cincinnati

Johnson & Sons Machinery Co., Wm. C.,
Kinsey Co., E. A., Cincinnati [St. Louis, Mo.]
Lucas & Son, J. L., Bridgeport, Conn.

Lynd-Farguhar Co., Boston, Mass.
McCabe Laths & Machinery Corp., J. J.,
149 Broadway, New York

McCoy-Brandt Mch. Co., Pittsburgh, Pa.
McMullen Mch. Co., Grand Rapids, Mich.

Marshall & Huchart Machinery Co., 17 S.
Jefferson St., Chicago

Molitor Mch. Co., Chas. 215 S. Clinton St.,
Chicago

Motch & Merryweather Mch. Co., Cleveland
Niles-Bement-Pond Co., 111 Broadway, N. Y.

O'Brien Machinery Co., Philadelphia
Osborne & Sexton Mch. Co., Columbus, O.

Osgood, J. L., Buffalo, N. Y.
Pattison Supply Co., W. M., Cleveland

Peninsular Machinery Co., Detroit, Mich.
Prentiss & Co., Henry, Singer Bldg., N. Y.

Russell Machine Co., Pittsburgh, Pa.
Simmons Machine Co., Albany, N. Y.

Smith Machinery Co., H. A., Syracuse, N. Y.
Stocker-Rumely-Wacha Co., 117 N. Jefferson
St., Chicago

Strong, Carlisle & Hammond Co., Cleveland
Thompson Co., C. M., 35 S. Clinton St. Chicago

Toomey, Inc., Frank, 127 N. 3rd St., Phila.
Vonnegut Machinery Co., Indianapolis, Ind.

Walsh Machinery Co., M. J., Milwaukee, Wis.
Warner, H. D., Hartford, Conn.

Wayne Mch. Co., Fort Wayne, Ind.
Winterer, Herman L., Philadelphia

White Machy. Co., A. D., 108 N. Jefferson
St., Chicago

Wright, David A., 608 Washington Blvd.,
Chicago

Shafts, Flexible

Stow Flexible Shaft Co., Philadelphia

Shaping Machines

Cochrane-Bly Co., Rochester, N. Y.
Columbia Machine Tool Co., Hamilton, Ohio
Davis Machine Tool Co., Rochester, N. Y.
Milwaukee Shaper Co., Milwaukee, Wis.
Osborne & Sexton Machy. Co., Columbus, O.
Rhodes Mfg. Co., Hartford, Conn.
Sellew Machine Tool Co., Pawtucket, R. I.
Simmons Machine Co., Albany, N. Y.
Smith & Mills Co., Cincinnati
Steptos Co., John, Cincinnati

Shears, Hand

Armstrong-Blum Mfg. Co. 341 N. Francisco
Ave., Chicago
Hendley & Whittemore Co., Beloit, Wis.
Lewthwaite Co., Geo. A., 116 Walker St., N. Y.
Tucker, W. C. & F. C., Hartford, Conn.

Shears, Power

Hendley & Whittemore Co., Beloit, Wis.
Long & Alstatter Co., Hamilton, Ohio

Sine Bars

Way Co., A. F., Hartford, Conn.

Slotting Machines

Clough, R. M., Meriden, Conn.
Rhodes Mfg. Co., Hartford, Conn.

Sprockets

Cullman Wheel Co., 1344 Altgeld St., Chicago

Stack Supports

Racine Tool & Machine Co., Racine, Wis.
Way Co., A. F., Hartford, Conn.

Swaging Machines

Etna Mfg. Co., Toledo, Ohio

Tables, Circular

Cochrane-Bly Co., Rochester, N. Y.
Hinckley Machine Works, Hinckley, Ill.
Lewthwaite Co., Geo. A., 116 Walker St., N. Y.

Tap Extractors

Walton Co., Hartford, Conn.

Tap Wrenches

Alert Tool Co., Philadelphia

Tapping Machines and Attachments

Beaman & Smith Co., Providence, R. I.
Burke Machine Tool Co., Conneaut, Ohio
Cincinnati Pulley Machinery Co., Cincinnati
Penn Mfg. Co., Hartford, Conn.
Greenfield Tap & Die Corp., Greenfield, Mass.
Hammond Mfg. Co., Cleveland
McCrosky Tool Corporation, Meadville, Pa.
Modern Tool Co., Erie, Pa.
Rickett-Shafer Co., Erie, Pa.
Turner Machine Co., Danbury, Conn.
Webster & Perks Tool Co., Springfield, Ohio
Whitney Mfg. Co., Hartford, Conn.
Workwell Eng. & Mfg. Co., 616 W. Monroe
St., Chicago

Taps, Collapsing

Modern Tool Co., Erie, Pa.
Murchey Machine & Tool Co., Detroit, Mich.

Taps and Dies

Greenfield Tap & Die Corp., Greenfield, Mass.
National Acme Company, Cleveland

Thread Cutting Tool Jigs

G-L Sales Co., 521 W. 26th St., New York

Thread Milling Machines

Waltham Machine Works, Waltham, Mass.

Threading Tools

Armstrong Bros. Tool Co., 206 N. Francisco
Ave., Chicago
Greenfield Tap & Die Corp., Greenfield, Mass.
Modern Tool Co., Erie, Pa.
Murchey Machine & Tool Co., Detroit, Mich.
National Acme Company, Cleveland
Ready Tool Co., Bridgeport, Conn.

Classified Finding Index

Tool Holders

Armstrong Bros. Tool Co., 308 N. Francisco
Av., Chicago
Ready Tool Co., Bridgeport, Conn.
Wiggins & Co., A. V., Syracuse, N. Y.
Wood Turret Machine Co., Brazil, Ind.

Tools, Boring

Alert Tool Co., Philadelphia
Armstrong Bros. Tool Co., 308 N. Francisco
Kelly Reamer Co., Cleveland [Av., Chicago]

Tools, Lathe and Planer

Armstrong Bros. Tool Co., 308 N. Francisco
Av., Chicago
Ready Tool Co., Bridgeport, Conn.

Tools, Machinists'

Armstrong Bros. Tool Co., 308 N. Francisco
Av., Chicago
Brown & Sharpe Mfg. Co., Providence, R. I.

Tools, Spot Facing

Genesee Mfg. Co., Rochester, N. Y.

Tooth Rounding Machines

Cross Gear & Engine Co., Detroit, Mich.

Trucks, Machine Shop

New Britain Machine Co., New Britain, Conn.
Towsley Mfg. Co., John T., Cincinnati

Turntables

Canton Foundry & Machine Co., Canton, O.

Turret Heads, for Lathes

Newman Mfg. Co., Cincinnati

Valve Seat Planing Machines, Portable

Stow Flexible Shaft Co., Philadelphia
Underwood Corp., H. B., Philadelphia

Vises, Drilling Machine

Ainslie Mch. & Tool Works, Hartford, Conn.
Armstrong-Blum Mfg. Co., 341 N. Francisco
Av., Chicago

Armstrong Bros. Tool Co., 308 N. Francisco

Carter & Hakes Mch. Co., W. Wingsted, Conn.
Cincinnati Vise Co., Cincinnati
Hoganson & Pettis Mfg. Co., New Haven, Conn.
Hollands Mfg. Co., Erie, Pa.
Martin Tool & Die Co., Springfield, Ohio
Nestor Mfg. Co., 40 W. 13th St., New York
Thomas Elevator Co., 21 So. Heyne Ave.,
Yost Mfg. Co., Meadville, Pa. (Chicago)

Vises, Machinists'

Hollands Mfg. Co., Erie, Pa.
New Britain Machine Co., New Britain, Conn.
Yost Mfg. Co., Meadville, Pa.

Vises, Milling Machine

Carter & Hakes Mch. Co., W. Wingsted, Conn.
Cochrane-Hly Co., Rochester, N. Y.
Edlund Machinery Co., Inc., Cortland, N. Y.
Hardinge Brothers, 1770 Bortau Av., Chicago
Hartford Special Mch. Co., Hartford, Conn.
Hollands Mfg. Co., Erie, Pa.
Nestor Mfg. Co., 40 W. 13th St., New York
Sellew Machine Tool Co., Pawtucket, R. I.
Spafford Tool Works, Hartford, Conn.
Steptoe Co., John, Cincinnati
Yost Mfg. Co., Meadville, Pa.

Vises, Shaper

Steptoe Co., John, Cincinnati

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Whitney & Son, Baxter D., Winchendon, Mass.



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the Best Plants in the Country

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Special Prices if you refer to this ad.



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Chicago No. 00 27 in. Wheels
 " No. 0 32 " "
 " No. 1 36 " "



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8 in., 5 and 6 ft. tables and guard.
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 and guard.

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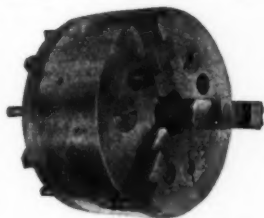
Index of Advertisers

Abbott Ball Co.....	10	Bickett Machine & Mfg. Co.....	29
Abrasive Machine Tool Co.....	93	Biggs-Watterson Co.....	176
Acme Machine Tool Co.....	8	Bignall & Keeler Mche. Works...	127
Adams Manufacturing Co., O. R.	25	Blount Co., J. G.....	81
Ainslie Machine & Tool Works..	70	Bonney Vise & Tool Works.....	190
Alert Tool Co.....	54	Boston Scale & Machine Co.....	124
Allen Machinery Co., B. C.....	167	Boye & Emmes Mche. Tool Co.	15
American Milling Machine Co....	33	Bristol Machine Tool Co.....	88
Anderson Bros. Mfg. Co.....	136	Broadway Machinery Co.....	182
Armstrong-Blum Mfg. Co.....	107	Brown-McDonald Mchy. Co.....	161
Armstrong Bros. Tool Co.....	130	Brown & Sharpe Mfg. Co.....	5
Atlas Press Co.....	120	Brownell Machinery Co.....	162
Aurora Tool Works.....	59	Buchanan Chemical Co., C. G....	101
Austin Tool & Machine Co., Inc.	58	Buchanan Co., Thos.....	100
Badger-Packard Mchy. Co.....	156	Bunting Brass & Bronze Co.....	135
Badger Tool Co.....	79	Burke Machine Tool Co.....	34-68-165
Baird Machinery Co., W. J.....	164	Caneydy-Otto Mfg. Co.....	61
Barr, H. Edul.....	106	Canton Foundry & Mche. Co.....	132
Barrett Machine Tool Co.....	42	Carroll Mfg. Co., L. W.....	148
Bartlett, Edwin E.....	121	Carter & Hakes Machine Co....	36
Bath & Co., Cyril J.....	159	Chard Lathe Co.....	19
Beaman & Smith Co.....	69	Chattanooga Machinery Co.....	131
Becker Milling Machine Co.....	35	Chicago Machinery Exchange....	198
Bell & Gossett Co.....	100	Cincinnati Automatic Mch. Co....	6
Bennett Machinery Co., G. L.....	180	Cincinnati Ball Crank Co.....	134
Bennett Co., W. R.....	4	Cincinnati Planer Co.....	7

"The Lavoie Air Chuck

is far superior to any chuck we have had"

is the report from one big company whose name is a household word, and wherever the "Lavoie" is used it is demonstrating its great economy and convenience.



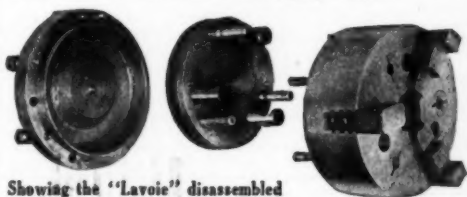
Made in many sizes

Made in seven types

**Six types of universal
or combination jaws**

Simplicity of Construction

with low cost of installation and ease and quickness of operation, are the reasons why the "Lavoie" has already created such a "stir". The chuck, cylinder and piston are combined in a single unit—no heavy cylinder on rear end of spindle. There are no gears, and no double piping is required.



Showing the "Lavoie" disassembled

Look into it, anyway. And why not now?

Frontier Chuck & Tool Co.

36 Letchworth St.,

Buffalo, N. Y.

Index of Advertisers—Continued

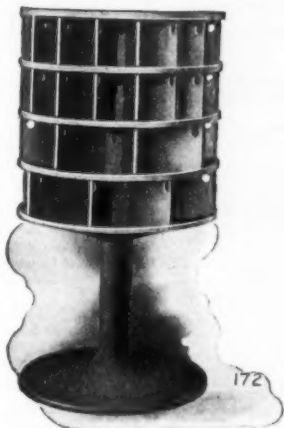
Cincinnati Pulley Mch. Co.....	45	Hartford Special Machinery Co....	66
Cincinnati Specialty Mfg. Co.....	40	Heald Machine Co.....	75
Cincinnati Vice Co.....	64	Hendley & Whittemore Co.....	115
Cleveland Belting & Mch. Co....	167	Henry & Wright Mfg. Co.....	51
Cleveland Flue Cleaner Mfg. Co.	10	Herlth Mfg. Co., O. B.....	74
Clough, R. M.....	40	High Speed Hammer Co.....	53-123
Cochrane-Bly Co.....	105	Hill, Clarke & Co., of Chicago...	179
Columbia Machine Tool Co.....	140	Hinckley Machine Works.....	30
Conrad, E. W.....	169	Hoggson & Pettis Mfg. Co.....	147
Contract Work Wanted.....	190	Hollands Manufacturing Co.....	64
Conway & Co.....	146		
Craftman Tool Co.....	102	Independent Pneumatic Tool Co.	60
Cross Gear & Engine Co.....	133		
Cushman Wheel Co.....	128	Jacobs Mfg. Co.....	145
Cushman Chuck Co.....	144	Johnson & Sons Mch. Co., Wm. C.	158
		Johnston Co., Wm. T.....	169
Dale-Brewster Mch. Co.....	171		
Dalton Manufacturing Corp.....	23	Kelly Reamer Co.....	56
Davenport Manufacturing Co.....	34	Kinsey Co., E. A.....	162
Davie Tool Co.....	98	Knickerbocker Co.....	138
Davis Machine Tool Co.....	125	Knight Machinery Co., W. B.....	63
Demco Machine Tool Co.....	50	Kreiter Machine Co.....	167
Dickow, Fred. C.....	26		
		Lambert Mche. & Engineering Co.	48
Edgemont Machine Co.....	148	Lapointe Co., J. N.....	104
Edlund Machinery Co., Inc.....	57	LaSalle Tool Company.....	76
Enterprise Machinery Co.....	116-164	Lee Co., Frank H.....	31
Esley Machinery Co., E. L.....	168	Lewthwaite Co., George A.....	137
Etna Manufacturing Co.....	104	Lewthwaite Machine Co., T. H.	136
Euclid Crane & Hoist Co.....	132	Long & Allstatter Co.....	114
		Loshbough-Jordan T. & M. Co....	116
Factory & Mill Supply Co.....	188	Lourie Mfg. Co.....	120
Falstrom & Tornqvist Co.....	151	Lucas & Son, Inc., J. L.....	182
Federal Machinery Sales Co.....	163	Lynd-Farquhar Co.....	184
Fenn Mfg. Co.....	86		
Fitzgerald & Co., W. H. J.....	176	McCabe Lathe & Machinery	
Frontier Chuck & Tool Co.....	199	Corporation, J. J.....	186-187
		McCoy-Brandt Machinery Co....	155
Genesee Manufacturing Co., Inc.	110	McCrosky Tool Corporation.....	149
Geuder, Paeschke & Frey Co.....	190	McDonough Mfg. Co.....	89
Giddings & Lewis Mfg. Co.....	43	McLaughlin & Co., A. A.....	168
G-L Sales Company.....	97	McMullen Machinery Co.....	184
Girard Machine & Tool Co.....	163	Madison Manufacturing Co.....	54
Gits Bros. Mfg. Co.....	134	Manhattan Mche. & Tool Works	86
Gooley & Edlund, Inc.....	36	Marchke Manufacturing Co., Inc.	91
Grand Rapids Grinding Mche. Co.	92	Marshall & Huschart Mch. Co....	178
Grant Mfg. & Machine Co.....	4	Martin Tool & Die Co., J. E....	66
Graves Machinery Exchange.....	185	Mauch Chunk Iron Works.....	190
Greaves-Kluman Tool Co.....	9	Michigan Tool Co.....	130
Greenfield Machine Co.....	80	Milwaukee Shaper Co.....	139
Greenfield Tap & Die Corp n.....	77	Minster Machine Co.....	50
Gwilliam Company, The.....	102	Modern Tool Co.....	203
		Molitor Machinery Co., Chas. ...	166
Hamilton Caster & Mfg. Co.....	38	Monarch Machine Tool Co.	16
Hammond Manufacturing Co.....	47	Morse Chain Co.....	142
Haninge Bros., Inc.....	18	Motch & Merryweather Mch.	
Harris Brothers Co.....	154	Company.....	174-175
		Mueller Machine Tool Co.....	46
		Murchey Machine & Tool Co....	70

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for
Greatest
Utility

Revolving Screw Rack

Built
for
Longest
Service

For Screws, Nuts and Other Small Parts



Adjustable Compartments—Ball Step Bearing

It easily holds 500 to 600 lbs. of stock. As regularly furnished, it has 48 compartments, the upper ones holding about two quarts each, and the lower ones twice as much. It revolves at a touch. No argument should be needed to demonstrate the great saving in assembling-time by having the necessary bolts, nuts, screws and other findings right at hand in the "New Britain" Revolving Screw Rack.

Free Bulletin No. 1210 describes it fully

The New Britain Machine Company

**"Shop Furniture
Originators"**

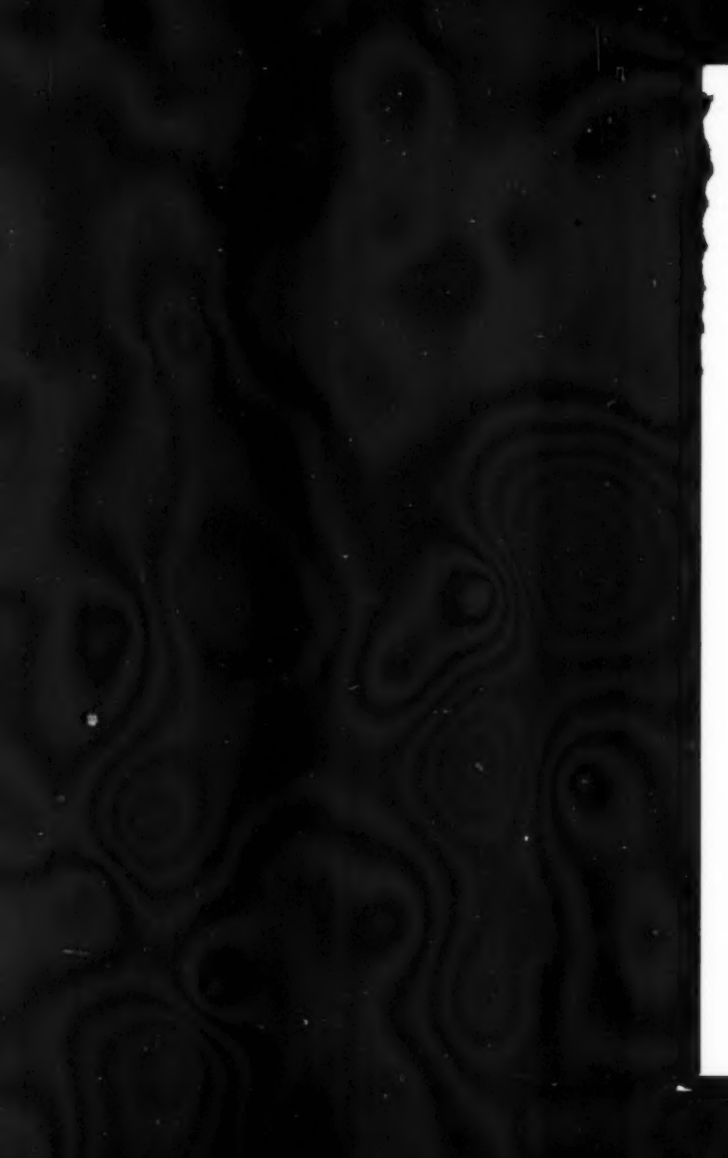


**New Britain,
Conn. U.S.A.**

Index of Advertisers—Continued

National Acme Company.....	3	Smith Machinery Co., H. A.....	178
National Clutch Co.....	146	Smith Mfg. Co., Philip.....	18
National Mch. Tool Co., Cincinnati	58	Smurr & Kamen Co.....	12
National Mche. Tool Co., Racine	94	Somers, Fidler & Todd Co.....	168
Nelson-Blanch Mfg. Co.....	52	South Bend Lathe Works.....	21
Nestor Mfg. Co., Inc.....	62	Spafford Tool Works.....	62
New Britain Mche. Co...190-201-204		Steber Machine Co.....	190
Newman Manufacturing Co.....	14	Steinle Turret Machine Co.....	13
Nicholson & Co., W. H.....	103	Steptoe Company, John.....	37
Nielsen-Barton Chuck Co.....	144	Stocker-Rumely-Wachs Co.....	152
Niles-Bement-Pond Co.....	153	Stow Flexible Shaft Co.....	96
Nivin Manufacturing Co., Inc.....	129	Strand & Co., N. A.....	94
North Side Tool Co.....	98	Strong, Carlisle & Hammond Co.	160
O'Brien Machinery Co.....	151	Taylor & Fenn Co.....	117
Osborne & Sexton Mch. Co.140-170		Terrell's Equipment Co.....	126
Osgood, J. L.....	162	Thomas Elevator Co.....	143
Ott Grinder Co.....	96	Thompson Co., C. M.....	169
Partridge, E. O.....	112	Thompson Grinder Co.....	84
Pattison Supply Co., W. M.....	173	Titchener & Co., E. H.....	166
Pawling & Harnischfeger Co.....	48	Toomey, Inc., Frank.....	158
Pedrick Tool & Machine Co.....	113	Towley Mfg. Co., John T.....	108
Peerless Machine Co.....	111	Tucker, W. C. & F. C.....	122
Peninsular Machinery Co.....	164	Turner Machine Co.....	41
Perfection Auto Parts Co.....	190		
Peter Bros. Mfg. Co.....72-108		Underwood Corporation, H. B.....	150
Prentiss & Co., Henry.....	181	United Hammer Co.....	106
Pyott Foundry Co.....	27	United States Mche. Tool Co.....	32
Quickwork Co.....	114	Van Dorn Electric Tool Co.....	67
Racine Tool & Machine Co.....	109	Vonnegut Machinery Co.....	177
Ready Tool Co.....	38		
Reed Co., Francis.....	46	Walsh Machinery Co., M. J.....	188
Reid Brothers Co., Inc.....	85	Waltham Machine Works.....	99
Reliance Elect. & Engineering Co.	2	Walton Co.....	28
Reliance Machinery Sales Co.....	166	Warner, H. D.....	160
Rhodes Mfg. Co.....	141	Waterston, J. M.....	56
Richards, Anson W.....	165	Way Co., A. F., Inc.....	74
Rickert-Shafer Co.....	73	Wayne Machinery Co.....	172
Ritchie-Wertz Co.....	24	Weaver Mfg. Co.....	119
Robbins, Gamwell & Co.....	190	Webster & Perks Tool Co.....	87
Rockford Drilling Machine Co. ..	44	White Machinery Co., A. D....	156
Rockford Iron Works.....	118	Whiting & Comstock.....	30
Russell Machine Co.....	157	Whitney Mfg. Co.....	39
Savage Co., W. J.....	112	Whitney & Son, Baxter D.....	78
Schipper Machine & Tool Co.....	28	Wickes Brothers.....	24
Schmidt Co., B. L.....	88	Wiggins & Co., A. V.....	14
Scully-Jones & Co.....	71	Willard Machine Tool Co.....	17
Second-Hand Machinery...151 to 189		Willard Press & Tool Co.....26-118	
Sellew Machine Tool Co.....	52	Wilmarth & Morman Co.....	95
Sidney Machine Tool Co.....	20	Winterer, Herman L.....	165
Silver Manufacturing Co.....	49	Wisconsin Electric Co.....	82-83
Simmons Machine Co.....90-183		Wood Turret Machine Co.....	11
Sipp Machine Co.....	55	Worcester Lathe Co.....	22
Smith & Mills Co.....	142	Workwell Eng. & Mfg. Co.....	72
		Wright, David A.....	189
		Yost Manufacturing Co.....	65







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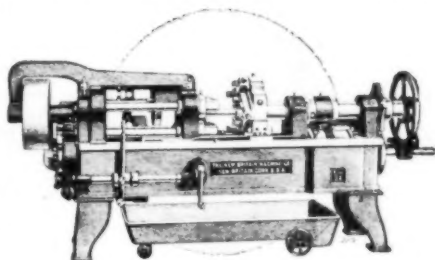
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Simultaneous
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Automatic

In the Chucking of Castings and Forgings
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A machine which operates greatly to your own profit, while performing the patriotic service of multiplying production and reducing costs on all work within its scope.

The reason is that it performs up to four or five end operations *simultaneously, automatically and continuously*—no stoppage even for loading and unloading.

Then we have Double-Head Automatics, which machine both ends at the same time.

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